

39

RECORD

J. R. Fosbergs

1 Xerox copy

pages 69 and 80

J. R. Fosberg

Collection and Field Note Book

No. 39

(Feb. 5, 1954 - Aug. 6, 1954)

(35677 - 35991)

JAPAN

O-shima Island, Izu Island (s. of Tokyo Bay)	
Japan .....	1-5
Trail above Nomashi .....	5-7
Lowlands between Motomuna and Okada .....	7
Trail above Nomashi on north slopes of volcano ..... 35677-35687 ...	8-9
Mihara Yama cone ..... 35688-35691 ...	10
Midway Island near Airfield. 35692-35705 ...	12-13
General vegetation .....	14-15

CALIFORNIA

Altamont Pass Hills, Turlock Farm, Kings River near Hub(s. of Fresno), Santa Ynez Mts.....	16-17
--	-------

KANSAS

Lawrence University of Kansas .....	18-20
-------------------------------------	-------

VIRGINIA

Fairfax County, Annandale Road .....	22
Williamsburg..... 35706-35711 ...	24-25
Alexandria, s. of Shirley Hwy 35713 .....	26-27
Fauquier County, e. of Markham .....	28-29
..... 35714-35718 ...	
Shenandoa Nat.'l Park, Dickey Hill .....	30-31
..... 35719-35720 ...	
Big Meadows, Franklin Cliffs, Fisher Gap	
..... 35721-35736 ...	32-35
Appalachian Trail s. of Fisher Gap ....	
..... 35737-35740 ...	36-37

Pages

<u>CANADA, ENGLAND, FRANCE (from air).....</u>	<u>40-41</u>
<u>FRANCE, Seine et Marne</u>	
Forêt de Fontainebleau ..... 35741-35755	42-45
2-4 km n. of Fontainebleau .....	46-47
Fontainebleau Forest between Vallee de La Solle and Barbizon.....	48-50
Mare aux Couleuvres, Forêt de Fontainbleau ..... 35756-35762..	50-53
Route Nat. 7, n.w. of Fontainebleau Forest	54-55
Fontainebleau ..... 35763-35772...	56-57
Seine et Marne - Loiret, between Nemours and Souppes sur Loing .....	58-59
Loiret, Nievre, Allies .....	60-61
Dept. Puy de Dome, Clermont-Ferrand .....	
..... 35773-35828..	62-75
Dept. Puy de Dome,n.e. of Lac Chauvet, above Rochefort-Montagne, Dept. Allies, Forêt de Bagnollet .....	76-87
Paris - s. of Orleans .....	88-89
Lamotte-Beuvron .....	90-94
Bersac - Limoge - Nexon - Negroudes .....	95-98
Ligueux - Perigueux - Les Eyzies, Dept. Dordogne..... 35848-35870..	99-109
Penne-Agen-Valence-Toulouse-Boussens .....	110-117
Lannemezan - Tarbes - Bagnères de Bigorre ..	118-121
Hautes-Pyrénées .....	122-131
Toulouse-Carcassone .....	132-137
Montpellier-Tarasson .....	138-139
Rhone R. to Marseilles .....	140-143
Hautes-Pyrénées - Alpes-Maritimes .....	
..... 35911-35922..	144-147
Dept. Var - Alpes maritimes... 35923-35980..	148-163
Nice-Menton .....	174-175
	... 2

## Collection and Field Note Book

No. 39 (cont'd)

	<u>Pages</u>
<u>ITALY</u>	
Ventimiglia - Alassio + .....	176-182
Florence to Milan.....	182-187
<u>ITALY + SWITZERLAND</u> .....	35981-35992 188-200

\* \* \*

J. R. Fosberg  
Collection and  
Field note book  
#39 #35677-35992



## Standard® Miniature Blank Book

- No. 665 9½ x 6 120 Pages Units
- No. 667 9½ x 6 200 Pages Units
- No. 668 9½ x 6 300 Pages Units

Made in the Following Rulings  
Journals, Day or Cash Books, Double \$ and Cts.  
S. E. Ledgers, \$ and Cts.  
Double Entry Ledgers  
Records with Margin Line

When ordering give Number and Ruling desired

Made in U. S. A.

WHEN ORDERING THIS BOOK SPECIFY  
STOCK NUMBER AND RULING DESIRED.

A BOORUM & PELASE PRODUCT

1954 Japan

1 3

Feb. 5 - O-shima Island, Izu Is. (s. of Tokyo Bay)

The island is about 7 miles long, elliptical, with a large caldera in the north half. In this caldera is an active central cone. Lava flows of 1878, 1950 and 1951 cover much of the caldera floor. Drifting ash of about  $\frac{1}{2}$  and size covers part of the floor and drifts over some of the lava flows.

The ports Okada and Motomura are on east and north sides respectively, with a small fishing village, Nomaki, to south of Motomura.

Road climbs around the mountain slope, zigzagging some, up to tea-house on caldera rim. Along this road the forest is mostly cleared. The lower slopes are clothed by a dense brake of *Amundinaria* (a *Passia*) 2-3 m. tall, very slender, (about the habit of *american* *amundinaria*). Love of this

area is in cultivated fields, these separated by hedges of *Arundinaria*.

Above the bamboo the slopes become bushy, part of the brush being evergreen scrub - forests of *Camellia japonica* 3-5 m. tall, now in flower with pink single flowers. The trees are twisted and gnarled.

Most of the scrub is deciduous, the principal plants being species of *Alnus* (*A. firma*), *Prunus*, *Hydrangea*, and *Weigela* (*W. koreana*). There are scattered evergreens - *Camellia*, *Cryptomeria*, *Eurya*, *Podocarpus*, *Elaeagnus*, *Rhododendron*, *Ilex crenata*, and *Lauraceae*. This is growing on bedded black and yellow-brown ash. *Dioscorea* is common twining in scrub. The entire area has evidently been cut over repeatedly, more actively in last 2-3 years.

Deciduous patches and evergreen are rather separate below, but

with some intergradation. Upward, near caldera rim evergreen becomes more abundant till, first a mixed scrub, then an evergreen scrub become fairly general near the rim.

The floor of the caldera and the active cone have little vegetation. The 1950 and 1951 flows are bare, rough lava, with no vegetation, but with ~~great~~ <sup>some</sup> areas of wind-blown ash and cinders with scattered wind-polished pebbles and cobbles of a dense gray rock.

A lipulka of 1778 lava with depressions filled with new ash, patches of rock between, these sandblasted. On this surfaces are patches of *Polygonum* sp. and hummocks of *Carex* sp. (perhaps also *Miscanthus sinensis*, which looks same - both are present acc. H. Hara). These plants collect ash.

The caldera rim has

a mosaic of patches of mixed scrub and *Miscanthus sinensis*.

Ravens are common in the caldera.

On the outer slopes on the trail down to Nonnashii are patches of small trees of *Camellia japonica* with little else, little undergrowth. These seem probably not planted but probably so favored by removal of other plants ~~so~~ that they are now dominant.

The *Camellia* nuts are harvested for oil which is used as a hair-dressing and in cooking. This is a specialty of O-shima.

Several years ago, all Helen Foster spruce forest of small *Cryptomeria* was common on these outer slopes. Now the trees have mostly been removed. There was a shrub layer between the trees. This is now dominant except where it has been clean cut for charcoal.

Here it is coming back vigorously.

Feb. 6 - Trail above Nonnashii *Arundinaria* only at low altitudes.

*Hedera* sp. common along trail at top of cliff. Woods of *Camellia*, *Cryptomeria*, *Pittosporum*, *Podocarpus*, *Lithocarpus*? *Pinus*.

*Camellia* forest of small trees, 5-6 m. tall, 10-12 cm. diam, smooth, bark gray brown; canopy not dense but practically complete. Little undergrowth except second story of small shrubs - *Ligustrum*, tree seedlings 0.5-0.8 ~~to~~ m. tall, *Ribes*, *Hydrangea japonica*?, *Corylus*, and a dense ground cover of *Carex*, *Ardisia*, *athyrium*, some broad-leaved herbs, *Botrychium* rare.

In ravines more fern, especially a large *Dryopteris*, other plants except *Carex* less common. *Carex* in flower. *Hedera* common but not forming a great part of ground cover.

The upper band of evergreen scrub around the caldera rim is definitely discontinuous here, interrupted by lobes of deciduous scrub.

Feb. 6 - Caldera floor

The surface of the 1778 lava flow is as described on p. 3, with *Polygonum*, *Carex* and possibly sterile *Miscanthus*, depressions filled with wind-blown ash, for 3/4 the way n.e. from the cone to the rim of the caldera.

Then a few very depressed bushes of *Alnus firma*, a few bushes of *Ilex crenata* and a few tufts of fertile *Miscanthus sinensis* appear on hummocks and ridges in the pahoehoe lava. The flats are covered by drifted ash with small scab-like lava protrusions.

Clumps of scrub, principally *Alnus* and *Ilex* become more abundant and larger nearer the rim of the caldera. Here appear dunes of sand-like ash

held by bushes, and ash ridges parallel to rim.

Rim. There are in places densely covered by scrub. The slopes of the rim, also, are covered by scrub except where they are of loose drifted ash, blown against the lower part of the cliff.

Feb. 6 - Lowlands bet.

Motomura and Okada - A flat of gray ash soil. Mostly cultivated, cut into a checkerboard pattern of fields separated by hedges of *Arundinaria* and rows of trees - *Pinus cryptomeria*, and some deciduous trees.

Lower slopes and bluffs above Okada Harbor are covered by a mixture of *Arundinaria*, deciduous shrubs, a few evergreen shrubs, *Camellia* and a few conifers.

8 1954 Japan

Feb. 3 - Trail west  
Nornashir on north  
slopes of volcano  
in mixed scrub

15677 *Conosanthus* *Nedtsea* *nuda* (Bl.)  
common

7 78 *Conosanthus* *Nedtsea* *nuda*  
common

7 79 *Fleichenia* *japonica*  
occasional on steep bank  
in predominantly evergreen  
scrub

7 80 *Rhododendron*  
occasional

7 81 ~~Thapeta~~ *Weigela* *kotlarensis*  
common

7 82 *Alnus* *firma*  
commonest shrub, locally  
dominant

7 83 *Camellia* *japonica*  
locally dominant

4 84 *Clacagnus*  
occasional

Feb. 6 - same  
Camellia forest and mixed scrub

85 *Ardisia* *brunnilis*  
common ground cover

86 *Botrychium*  
rare in Camellia forest on ridge

7 87 *Eurya* *japonica*  
common in mixed scrub

Izu Is. 9

700 m. (est.)

shrub leaves white  
beneath "Kusadani"  
leaves white  
"Kusadani"

2 m. tall

2 m. tall

3 m. tall

10 flowers  
"Subaki" "oil  
from seed used  
dressing and  
one of local specialties  
endemic shrub.

"gumi"

300 m. depressed shrub; fruit  
scarlet.

300 m.

400 m. bush 2 m. tall, buds black

Oshima

Obada (N)

Motomura (w.)

~~Mabushi~~

Nomaseki (w.)

Mihara Yama  
.....(volcano)

8

1954 Japan

Feb. 5 - Trail 2000  
Nomashiri on north  
slopes of volcano  
in mixed scrub

15677 *Camassia esculenta* Neolitsea sericea (Bl.)  
common

15678 *Camassia esculenta* Neolitsea sericea  
common

15679 *Gleichenia japonica*  
occasional on steep bank  
in predominantly evergreen  
scrub

15680 *Rhododendron*  
occasional

15681 ~~Plagiotheca~~ *Weigela koreana*  
common

15682 *Alnus firma*  
commonest shrub locally

15683 *Camellia japonica*

locally dominant

15684 *Clæagnus*  
occasional

Feb. 6 - same

15685 *Camellia* forest and mixed scrub

15686 *Ardisia dumilis*  
common ground cover

15687 *Botrychium*

rare in *Camellia* forest on ridge  
*Eurya japonica*  
common in mixed scrub

Jan 20, Oshima 1954

(cont. est.)

shrub leaves white  
beneath "kusadani"  
shrub leaves white  
beneath "kusadani"  
"orajido"

(cont. est.)

shrub 2 m. tall  
"istuji"  
shrub 2 m. tall

shrub 2-3 m. tall  
"yashū"

small tree flowers  
crimson. ~~aubaki~~ oil  
pressed from seed used  
for hair-dressing and  
cooking. One of local specialties.  
semi-scendent shrub.  
"gumi"

2 m. depressed shrub; fruit  
scarlet.

3 m.

4 m. bush 2 m. tall. buds black.

Feb. 9 - Mikawa-yama con.  
Dr. on base of 1772 lava  
flow, venting covered by  
loose scoriae and lava.

25498  
89  
90  
91

550m.

Feb. 19 - May 1954  
coast sand soil.

35692

on flat open ground

93 *Monnia*

one plant seen in scrub.

94 *Lathyrus torreyi* Steyermark  
one bush, in scrub

95 *Digitaria*

one in open weedy  
ground.

96 *Verbena strictifolia*  
locally abundant  
in open weedy ground

97 *Bonducia olraeae* L.  
common around  
buildings

98 *Lobularia maritima* L.

occasional along roads

99 *Lobularia maritima*  
abundant in open ground

35700

*Pluchea odorata*  
common around airstrip  
and buildings

01 *Coryza bonariensis*

abundant in open ground

02 *Bidens pilosa*

common in weedy ground

03 *Medicago lupulina* L.

planted as lawn carpet

04 *Malvastrum coccineum* (L.) Greene

around buildings <sup>2"</sup>

05 *Gnaphalium purpureum*

one around buildings <sup>2"</sup>

shrub 5 m. tall, almost  
leafless

— twigs very chlorotic

aromatic rays  
yellow.

flowers white

flowers white, very  
fragrant

~~up to 2 m. tall~~  
shrub 2 m. tall

up to 1.5 m. tall.

flowers yellow

The general vegetation is a scrub of *Feaverola*, *Verbenia* and *Verbena* with an understorey of grass. A few larger gaps of *Casuarina* with openings are covered by *Stenotaphrum*, *Lobularia*, *Sesuvium* etc.

Flora observed:

- a *Casuarina equisetifolia*
- 2 *Feaverola puncticentra*
- 2a *Verbenia exaltata*
- 2a *Stenotaphrum secundatum*
- 2a *Cynodon dactylon*
- 2c *Euphorbia heterophylla*
- 2c *Cyperus alternifolius*
- 2a *Ricinus communis*,  
*Crinum* sp. (cult.)
- 2a *Musa* sp. (cult.)
- 2a *Coccoloba uvifera*
- 2a *Terminalia catappa*
- 2a *Conyza bonariensis*
- 2c *Glibchea odorata*
- 2a *Lobularia maritima*
- 2a *Medicago lupulina* (cult.)
- 2a *Euphorbia hirta*
- 2a *Cleome indica*
- 2a *Sonchus oleraceus*
- 2a *Gloris inflata*
- 2a *Vitis riparia*
- 2a *Cenchrus esculentus*

- Portulaca oleracea*
- Verbania diffusa*
- Agrostis amabilis*
- 2a *Lolium nigrum*
- 2a *Digitaria*
- 2a *Muris*
- 2a *Calamus rehmannioides*
- 2a *Messerschmidia argentea*
- 2a *Ordens pilosa*
- 2a *Malvastrum coccineum*
- 2a *Grapheium purpureum*

Feb. 22 Altamont Pass  
Pastures broken and grazed,  
green but grass very  
short, large areas  
watered clean.

Feb. 24-25 - Turlock  
Farm - Marion has  
plowed up the 4 acre  
field and the same is only  
bare for 3 years. trees  
in pasture. Pasture  
infested with *Vermiculata*  
grass (*Cynodon dactylon*)  
Will raise this up and  
burn it. Then subsoil  
the piece and plow it  
again. Will plant  
watermelon.

The check of alfalfa  
just east of this, now  
being pastured, seem  
to be largely from a  
grass. Marion thinks  
alfalfa will be all the  
for another year.

Feb. 27 - Kings River  
near Hub (s. of Fresno)  
River bed sandy, dry  
except for large pools.  
*Salix* sp. common along  
bank, heavily infested  
with *Phoradendron*.

On flat ground nearby  
in small spots not  
cultivated *Capsella*  
*bursa-pastoris*, *Ansinkia*  
sp. and *Plagiobothrys* sp.  
are in flower.

Feb. 25 - Santa Ynez mts.  
grade back of Santa  
Barbara to La Cumbre  
at about 2500' *Ceanothus*,  
*Megacephala*, in full  
bloom is dominant  
in chaparral, with  
*Adenostoma fasciculatum*  
etc. Higher up this  
disappears, is replaced  
by *C. crassipolia* and  
the chaparral becomes  
more mixed. At  
La Cumbre, 4000' the  
chaparral is made up  
of *Arctostaphylos*,  
*Lithocarpus*, *Quercus*,  
much *Adenostoma*, etc.  
A few pines here, some  
planted. *P. coulteri*  
native but scarce.

Along this crest  
the ordinary coastal  
woodland trees, such  
as *Arbutus*, seem to  
be dwarfed.

March 3, 1954  
University of Kansas  
Natural History Museum

Bottom-land ~~wood~~  
fairly old second-growth  
forest of  
*Quercus rubra*  
*Q. marilandica*  
*Q. stellata*  
*Lilium*  
*Cornus* *Platanus* *orientalis*  
*Celtis occidentalis*  
*Gleditsia triacanthos*  
*Acer saccharinum*  
*Acer negundo*  
several *Carya* species  
with *Cornus drummondii*  
*C. sericea* *intolerans*  
*Vitis vulpina*

This is a deep black  
soil, 2-3 m. deep  
cut by a system of  
sharp V-havines.  
Apparently was at  
one time grassland,  
judging from the soil.

The *Quercus rubra*  
population displays a  
remarkable leaf variation  
from typical lanceolate to  
broadly obovate, almost  
"ob-deltoid".

The *Coronis sericea*,  
abundant here is  
arboreo<sup>opposite</sup> habit, up  
to 4 m. tall, with definite  
trunks up to 3 cm. diam.

This bottom is  
cut into a flat  
prairie, down through  
two series of beds of  
hard limestone.  
On top of the upper  
bed was formerly  
2-3 m. of soil, the upper  
layers black, the  
lower yellow-brown  
or red-brown very  
fine. In this residue  
the edge of the  
ravine is gullied  
and sheet eroded  
down so that most  
of the black soil is  
gone, many areas  
now rolling bare  
brown soil with grass.  
much of this planted.  
*Andropogon saccharoides*,  
*A. scoparius*, *Panicum*  
*virginicum*, *Lyngbyastrum*,  
*multicaule*, *Bouteloua ciliata*,  
pendula all have  
been planted here.  
Unplanted parts covered by

west side of.

A part of this flat  
covered with older woods  
of *Fraxinus* and *Ulmus*  
with undergrowth  
of *Corylus* and *Symphoricarpos*  
the prairie fire  
and being invaded by  
*Malus sylvestris*, *Tilia*,  
*Lanceolata*, *Ulmus*,  
*Rhus*, *Symphoricarpos*  
etc.

March 28 - 2 miles N.E.  
near Columbia (Va.)

Ground cover  
stand of *Laurus* virginica  
averaging 4-5 m. about  
20-25 m. tall, cover in  
very dense. Second  
story of *Corus* florida  
*Fagus grandifolia*, etc.

Ground layer -

- c *Mitchella repens*
- c *Vaccinium vacillans*
- l c *Chimaphila maculata*
- o *Smilax glauca*
- o *Goodyera pubescens*
- o *Rubus idaeus*
- l o *Antennaria plantaginoides*
- r-o *Polytrichum acrostichoides*
- r-l *Hypopodium complanatum*  
scattered mats of *Polytrichum commune*.

24 April 24 1954 Virginia

April 24 - Williamsburg  
Deciduous woods with  
some pine (Maedas), open  
beneath with few shrubs,  
rich herbaceous layer  
with abundant  
*Polystichum acrostichoides*.  
Many other species.

3572a *Obolaria virginica*  
small colony on  
road embankment.

11 08 *Stewartia ovata* (Lam.) Reichenb.  
common on edges of  
bluffs along river.

11 07 *Valerianella radiata* (L.) Dufresne  
occasional on road embankment

11 09 *Coleosanthus amabilis* Griseb.  
~~green~~ cultivated in greenhouse

April 25 south of Williamsburg  
11 10 *Camelina*  
weed in cultivated field.

April 25 - north shore of  
Chesapeake Bay just  
above confluence with James River

11 11 *Krigia*  
weed in open ground  
up. to Williamsburg

12 *Emilia*  
cultivated in greenhouse.

Remarks

leaves purplish green  
flowers white.

shrub 2 m. tall.

flowers white.

leaves fairly firm,  
flowers exceeding  
envelope, whitish with  
deep pink tips.

erect; flowers pale yellow.

flowers orange-yellow;  
leaves pale green, glaucous.

No.

det. F. R. Fosberg

no sketch 24 1954 Virginia

april 24 - Williamsburg  
Deciduous woods with  
some pine (*Pinus*); open  
beneath with few shrubs,  
rich herbaceous layer  
with abundant  
*Polystichum acrostichoides*.  
Many other species.

3570. *Abolania virginica*  
small colony on  
road embankment.

11 08 *Stewartia ovata* (L.) Wendl.  
common on edges of  
bluffs along river.

11 07 *Valerianella radiata* (L.) Dufr.  
occasional on road embankment

11 09 *Kolkwitzia amabilis* Griseb.  
~~green~~ cultivated in greenhouse

April 25 - south of Williamsburg  
2 10 *Camelina*  
weed in cultivated field.

April 25 - south shore of  
Chesapeake Bay just  
above confluence with James River

11 11 *Krigia*  
weed in open ground

Apr. 25 Williamsburg

12 12 *Emilia*  
cultivated in greenhouse.

25

leaves purplish green.  
flowers white.  
shrub 2 m. tall.

flowers white.

leaves fairly firm.  
flowers exceeding  
envelope, whitish with  
deep pink tips.

erect; flowers pale yellow.

flowers orange-yellow;  
leaves pale green, glaucous.

26

1959 Virginia

1650 ft

May 23 - south of Luray

Highway east of Luray, Va.

Cult fields with foliage

Barley, 7 rags, grass, etc.

25713 *Cænothera perennans* -

small colony

Alexandria

27

flower with calyx  
carmine-mauve, petal  
bright yellow, tips of  
inflorescence pendent.

28 1954 Virginia

June 2 - 4 miles east of  
Markham

weedy road cut

35714 *Papaver dubium* L.

common along road

15 *Plantago aristata* Michx.

common

16 *Verbena simplex* Linn.

common

17 *Cyperus*

rare

18 *Bromus*

abundant

The poppy is common  
for about 1/2 miles east  
of Markham, and  
rarely for a mile or  
two west of it.

From well east of  
Markham to ~~the~~  
Front Royal the *Platanus*  
*occidentalis* seems to  
be seriously depoliated  
only the youngest tips  
being still green.

Fauquier Co.

29

erect, flowers scarlet,  
stamens black.

erect, flowers blue-lavender.

~~at~~ panicles drooping.

30 June 1959 Virginia

148 June 12 - Dickey Hill

35719 *Papaver dubium* L.  
rare along weedy roads

June 12 - Jeremy Run

51120 *Galium mollugo* L.  
common along open  
roadsides, banks and cuts

*Isatis tinctoria* common  
the length of the Northern  
section, only occasional  
or local in Central section.  
Apparently two crops -  
about equal numbers  
in almost ripe fruit  
and in flower, none  
seen intermediate

Shenandoah Nat. Park 31

~~petals~~ petals scarlet  
stamens black.

procumbent, many  
long stems from  
root crown, forming  
patches 1-2 m. across.

*Robinia* becoming  
more and more  
abundant along roadsides.

not checked

32 1994 Virginia

whole typed

50K June 2 - Big Meadow

meadow with abundant  
brushes and small trees.

35711 *Lycopodium tristachyrum*  
occasional small colonies  
5 122 *Rhododendron roseum* (Spreng.) Rehd.  
single plant in

4 3123 *Viburnum acerifolium* L.  
occasional in

5 4124 *Potentilla simplex*  
local in low shaded  
spots in

7 125 *Fragaria virginiana* L.  
abundant in

4 4126 *Oenothera fruticosa* (L.) Linnaeus?  
common locally on slopes in

*Vaccinium stamineum* very  
common in meadow and  
in full bloom.

*Kalmia latifolia* common  
in woods and less so in  
meadow, some bushes only  
in bud, others in almost  
full flower.

Shenandoah Nat. Park 33

abigons buried except  
at tips

- shrub 1.5 m. tall,  
flowers rose-purple  
with red tube, deliciously  
fragrant (like ~~matthiola~~  
pink)

- shrub 1.3 m. tall, flowers  
white, pinkish or purplish

ing, arching,  
yellow  
fragrant  
in open,  
shad,  
ivy, achieve  
its  
it yellow,  
day.

down to  
the slopes  
a young  
ala populifolia  
isher gap

is a fine grove of hemlock  
with a thick layer of  
needles and twigs with  
little herbaceous growth.  
In ant-hills, large ones several  
feet across, *Poa compressa* common in fill.

# PLANTS OF VIRGINIA

## SHENANDOAH NATIONAL PARK

## BLUE RIDGE MOUNTAINS

Loc. BIG MEADOWS

(4 mi. s. e. of Marksville,)

**MADISON Co.**

Habitat extensive meadow,  
with scattered bushes and trees

Date / /19

Coll. F. R. Fosberg

Alt.

m.

No.

Det.

Remarks

checked

32 1954 Virginia

white type

4K June 12 - Big Meadows

meadow with abundant  
bushes and small trees.

2571) *Lycopodium tristachyrum*

occasional small colonies,

5 122 *Rhododendron roseum* (Loisel.) Rehd.  
single plant in

6 1123 *Viburnum acerifolium* L.  
occasional in

6 1124 *Potentilla simplex*  
local in low shaded  
spots in

7 125 *Fragaria virginiana* L.  
abundant in

4 1126 *Oenothera fruticosa* (var. linearis?)  
common locally on slopes in

*Vaccinium stamineum* very  
common in meadows and  
in full bloom.

*Kalmia latifolia* common  
in woods and less so on  
meadows, some bushes only  
in bud, others in almost  
full flower.

Shenandoah Nat Park 33

rhizome buried except  
at tops  
- shrub 1.5 m. tall,  
flowers rose-purple  
with red tube, deliciously  
fragrant (like ~~essentia~~  
pinks).

- shrub 1.3 m. tall; flowers  
white, pinkish or purplish,  
without

- stems ascending, arching,  
petals bright yellow,  
slightly emarginate,  
small plants in open,  
larger ones in shade;  
fruit <sup>round, waxy</sup> red, juicy, achenes  
sunken in pits  
flowers bright yellow,  
open during day.

From Big Meadows to  
Fisher Gap the slopes  
are covered by a young  
growth of *Betula populifolia*.  
Just before Fisher Gap  
is a fine grove of hemlock  
with a thick layer of  
needles and twigs with  
little herbaceous growth.

In ant-hills, large ones several  
feet across, *Poa compressa* comes in first.

34 1954 Virginia

June 3 - Franklin Cliffs  
dry rocks and weedy  
gilders.

35 727 *Lepidium campestre* (L.) R. Br.  
rare, weedy ~~playground~~ parking  
area, ~~overlook~~ overlook

4 3128 *Bromus tectorum* L.  
locally common in weedy  
spot around parking &  
overlook.

4 129 *Bromus* ~~hastatus~~ f. *leucostachys* (Hornem.)  
locally common in  
weedy place around parking  
overlook

1 130 *Silene caroliniana* L.  
~~Pennsylvanica~~ (Mx. Ten.)  
in shaded rock crevices

2 3131 *Rumex crispus* L.  
steep weedy rocky road  
embankment

June 3 - Fisher Gap  
grassy roadsides

3 3132 *Poa*  
dominant near road  
caespitose

3 3133 *Solidago* ~~canadensis~~ (L.) Nash, <sup>var.</sup> ~~canadensis~~  
abundant locally along  
the Skyline Drive

3 3134 *Festuca*  
common  
caespitose

2 3135 *Dactylis glomerata* L.  
occasional  
erect

2 3136 *Festuca*  
common  
erect

Shenandoah Nat. Park 35

erect, petals white.

erect, spikelet drooping,  
purpleish.

erect, spikelet green,  
only slightly compressed.

flower pale pink.

erect, leaves strongly  
crisped.

36 1954 Virginia

June 13 - appalachian trail  
south of silver gap,  
wooded west slopes

35737 *Dryopteris disjuncta*  
2 34 very rocky ground in  
deciduous forest

1 138 *Orobanchis uniflora*  
rare, edge of trail

2 139 *lycoperdon complanatum*  
springs on rocky,  
wooded slope

2 140 *Viola canadensis* L.  
abundant in Tunga grove  
in deep shade.

Shenandoah Nat. Park 37

plant bronzy white,  
flowers lavender  
with lower side of tub yellow  
prostrate, rhizome  
not deeply buried.  
erect, flowers  
white tinged with  
purple, becoming  
purple ~~so~~ in age.

38

39

June 26 - The area around Montreal is intensively cultivated with rather little wood of any kind. The feature most impressive is the greenness. This is such as to indicate a very wet climate, at least at this season.

### England (from air)

June 27 - The coast of Cornwall, from the air, seems not to have any chalk cliffs. What rocks there are are dark and the sand is brown. The country is intensively cultivated with the fields separated by hedgerows of bushes and low trees with fairly numerous taller trees scattered along them.

The fields are largely green, but a green showing the ground through it in many cases. Many fields plowed.

June 27 - Normandy is intensively cultivated, with but a few small patches of woods. The fields are small and separated by hedgerows in which tall trees are not so conspicuous as those in Cornwall. The fields are in about the same condition of greenness and cultivation as in Cornwall. Trees are planted sparingly in many of the fields, but not as closely as in an ordinary orchard. Cultivation between them.

Neader to Paris, to n.w. of Paris, the hedges disappear. The fields are separable principally by the pattern of cultivation, stages of development of crops, and different crops (grain, beets, mustard, etc.). Fields larger. Houses almost entirely grouped in villages. Patches of forest larger and more numerous, becoming more numerous nearer Paris.

July 4 - Forêt de Fontainebleau -

Near Roche Eponge, 1-1.5 km. n.e. of Fontainebleau

Pine forest on sandstone hills, rather open  
with some heather on sandstone outcrops.

Soil sandy but with a definite peaty layer.

3 35741 *Amelanchier vulgaris* Moench

In series on sandstone boulders.

42 *Erica cinerea* L.

Abundant <sup>relatively</sup> in open rocky places.

Hill tops with outcroppings of sandstone  
weathered with angles weathered off into rounded  
shapes with soil between them of white sand  
covered with brown moss mixed with sand.

Mossy carpet where not too much tangled,  
patches of heather general with scattered  
shrubs of Juniper, Young *Opinus robm.*  
*Castanea*, etc. some tufts of *Deschampsia*  
*flexuosa*; the rocks with abundant foliose  
lichens & *hypnoid* mosses, some tufted  
*grimmia* mosses, the whole covered by an  
open woodland of several species of pine and  
*Opinus robm.* with scattered beeches.

Flat sandstone uplands with abundant  
outcroppings have some *Pteridium aquilinum*,  
*Lonicera* sp., scattered young birches, some  
other grasses, *Crataegus* and other shrubs and  
with the heather largely *Calluna* - *Polyodium*  
*virginianum* on the rocks with *Thuidium* and  
other mosses.

2 43 *Polyodium virginianum* L.

Common locally on mossy sandstone  
boulders.

Slender straggling shrub, 1-2 m. long, ripe  
- fruit dark blue.

Low shrub, 2-4 dm. tall, flowers magenta.

-

Rhizome bitter.

35 744 *Tilia sylvestris* Desv.  
2 On sandstone outcropping.

3 1 45 Open beech and pine forest on sandy soil  
*Ruscus aculeatus* L.

Isolated plant in shade.

2 1 46 *Brachypodium pinnatum* Beauvois  
(Erect small loose clumps.)

1 +7 *Vincetoxicum officinale* Moench  
Rare in open place

2 48

Common in open place.

2 49 *Melica nutans* L.

Occasional in open place

1 50 *Ilex aquifolium* L.

Rare in patch of pine

3 51 *Melampyrum pratense* L.  
In open oak forest, common.

3 # Km 87.5 Fontainebleau, s. of town  
Denecont

2 52 *Galium sylvestre* Poll.

Roadside bank in mixed pine-oak forest.

1 53 *Coronilla varia* L.

Roadside banks in mixed pine-oak forest

1 54 *Terracium chamaedrys* L.

Roadside banks in mixed pine-oak forest

2 55 *Neottia nidus-avis* Rich.

In pine young beech forest

Tree 10 m. tall.

Dwarf shrub 3 dm. tall, several stems  
from underground base.

Erect; flowers pale greenish-yellow.

Erect, tufted.

Dense tufts.

small tree 3 m tall, fruit immature.

Flowers yellow, lip brighter yellow.

Flowers white

Flowers purplish-pink

Flowers rose-pink

Plants brownish.

July 9 - 2-4 km. N. of  
Fontainebleau, vicinity  
of le Gros Fontaine natural  
history reserve, in the  
Bois de Fontainebleau.

A low plateau of fine  
gray to gray-brown calcareous  
soil, with a very few  
scattered limestone rocks,  
surrounded by escarpments,  
low on the south side, higher  
on the north, rimmed  
by sandstone boulders  
and outcroppings. General  
level of the plateau 111-114 m.,  
height of scarp, 40-50 m.  
but not very abrupt.

The plateau surface  
covered by a fine forest  
of oaks and beech, mixed,  
trees up to 200 m. or  
tall, and with trees up  
to well over 1 m. diam. The  
proportions of oak and  
beech vary locally from  
almost all one to almost  
all of the other. This forest  
is generally rather open  
beneath, but with  
uneven undergrowth  
of *Ilex aquifolium* and  
beech ~~scotia~~ saplings  
1-2(-3) m. high forming  
low thickets, alternating

with patches of *Ruscus*  
patch of <sup>of Rubus</sup> bracken, and  
a more or less connected  
matrix of grass of  
several kinds, especially  
what appears to be a  
*Festuca* and of *Hedera helix*,  
which also tends to climb  
the trees. *Juniperus* is very  
occasional, also *Laurus latifolia*.

On the escarpments most  
of the oak drops out  
immediately, and locally  
heather appears. The general  
vegetation on the escarpment  
is beech forest with some  
pine, some birch (*Betula*), and  
undergrowth of *Ilex* and  
*Pteridium* and some *Juniperus*  
and *Laurus latifolia*.

*Pinus sylvestris* tends to  
invade openings, or rather,  
*Betula* occupies them first  
and *Pinus* invades shortly  
thereafter. The pine is removed  
in the reserves, ~~as~~ as it is an  
introduced species. *Pteridium*  
is in large patches, either  
in the open or in the shade,  
seemingly irrespective  
of the kind of soil. ~~as~~  
sandy earths

July 9 - Fontainebleau Forest between Vallée de la Folle and Barbizon - general information furnished by forestry engineer in charge of area, M. Duron.

On sandy areas the succession is generally *Betula* (open)  $\rightarrow$  *Pinus sylvestris*  $\rightarrow$  *Fagus sylvatica* (with some *Quercus pubescens*). The beech is especially favored on bare sandstone. *Pinus laricio* is often grafted on *P. sylvestris* stock, forming a large tree but not regenerating from seed here. Seeds are produced but no seedlings, (whether from lack of germination or lack of survival not clear), failure suggested to be due to highly siliceous soil.

Pine was introduced here in 1780. It presents a great fire hazard (fires started principally by careless tourists) and much of the pine forest has been replaced by beech and oak in the last 100 years.

Of the oaks, *Q. robur* is principal species on calcareous soils. *Q. robur* and *Q. petraea* are grown on siliceous soils and from a forestry standpoint are considered, with their hybrids, as identical.

These forests, except in the natural history and artistic reserves, are very carefully managed. The cycle of management in oak forests is now 180 years and is to be increased to at least 200 years, the trees reaching 55-60 cm. diam. In the beech forest it is 120 years with the trees reaching 45-50 cm. diam. For pine it is 100 years, with the trees reaching 45 cm. diam. This is considered too long and will be reduced to 90 or even 80 years, which is more normal for pine. Beech is actually planted under pine when latter is 30-40 years old.

A large open area present for some distance along road is ascribed to large fires set by the Germans in 1945. Large parts of this are covered by a scrub of *Cytisus scoparius* and oak, and beech seedlings, with scattered small birch trees and a few small oaks. The pine will grow up fastest and form a forest. On better soils this will be replaced by hardwoods, but on very rocky sandstone terrain pine will be continued.

In 1720 there is said to have been an immense fire, set by people smoking out bees to get honey. The area has been repeatedly

July 9 - Mare aux Couleuvres,  
Forêt de Fontainbleau, about 5 km.  
n.w. of Fontainbleau

irregular surface of exposed sandstone with little soil, vegetation irregularly open.  
*Quercus pubescens*  
locally common

35756

7

burned over since, especially in 1945

The area around Mare aux Couleuvres is an irregular surface of sandstone with soil only in the depressions, which frequently have no outlets and are flooded after rains and water stands till it dries up. There is a general cover of *Erica cinerea* and *Calluna vulgaris* except on bare tops of rocks and in desiccated grottos. Small birches dominate the landscape, with some small *Quercus pubescens*, *Ledum album*, *Ledum* sp. (yellow-fl.) *Hypericum perforatum* and many other species, some of them rare and local in this region, are found here. *Pteridium* is abundant, *Populus tremula* locally common. Most of larger *Betula* have bases of trunks rough, thus probably belonging to *B. verrucosa* series.

small tree about 8 m. tall.

52 1954 France

35757 *Quercus pubescens*  
locally common

58 *Aegopodium alba* L.  
common in desiccating pools

59 *Hypericum humifusum* L.  
common in desiccating pools

60 *Fumaria vulgaris* L.  
*Coronaria sanguinea* L.  
rare

62 *Ranunculus flammula* var.  
local in desiccating pools

Seine et Marne

small tree about 8 m. tall,  
10-12 cm. diam. acorn  
from ground beneath.  
fruit red.

- flowers yellow.  
shrub 1 m. tall, ~~no~~ cyme  
reddish, fruit green.  
decumbent, flowers  
bright yellow.

53

July 11 - along Rt. N° 7  
n.w. of Fontainebleau, but

This area has lots of  
grain fields - wheat,  
oats, barley, rape (?) -  
varying from almost  
ripe to actually being  
harvested.

July 12 - between Fontainebleau  
and Montargis along  
Rt. N° 7.

Generally small fields,  
and patches of woods;  
rows of trees, esp. *Populus*,  
thickets of *Crataegus*,  
*Ligustrum*, *Robinia* (young),  
etc. some hedge-rows.

*Vinacum album* seen  
parasitizing *Populus*  
and *Robinia*.

Mixed flaneous cult-  
ivation - grain, alfalfa,  
beets, potatoes, vegetables,  
even maize, on rolling  
ground of chalks with  
chert or flint nodules.  
Fruit trees are scattered  
in some fields.

Some west-facing chalk  
slopes covered by close  
scrub of *Juniperus*.

communis. Some fine  
and oats also on chalk  
- stain of these west  
slopes are grassy.

*Robinia pseudo* is  
seen roads.

A few very small  
vineyards here.

July 14 Fontainebleau  
weedy ground

35763 *Galium sylvaticum* Pott.  
shaded spots,  
64 *Senecio jacobaea* L.  
common in sunnier places  
65 *Erigeron annuus*  
abundant in sun and shade

July 14 1 km. n.e. Fontainebleau  
in Forêt de Fontainebleau 100-140m. (map)  
roadside in rather  
open mixed forest of oak and pine.

66 *Teucrium scordonia* L.  
common generally  
67 *Carex glauca* Mun.?  
local  
68 *Quercus ~~et~~ robur* L.  
very common  
69 *Myosotis ~~et~~ silatica* Hoffm.  
rare, between sandstone  
rocks  
70 *Euonymus europaeus* L.  
rare in undergrowth  
71 *Clematis vitalba* L.  
occasional  
72 *Rubus saxatilis* L.  
common in open woods  
on flat rocky ground.

procumbent; flowers  
white.  
erect from ~~so~~ slender  
subterranean rhizomes,  
stems and under sides  
of leaves purplish; flowers  
deep yellow.  
erect, rays white to  
pale lavender, disk greenish yellow.

flowers pale ~~to~~ yellowish  
- odor strong. rhizome buried.  
loose colony, rhizome  
- buried. fruits dull yellowish.  
tree about 20 cm. diam.,  
- 10 m. tall.  
flowers pale blue

vine, extensively  
climbing in trees; flowers  
cream-white.  
forming low tangles up  
to 7-8 dm. tall; flowers  
pale pink.

Above the city to the north east between Roche Giffrage and Croix de la Croix, the sandstone plateau is covered by a rather open and rather low forest of oak and pine, with some ~~and~~ shrubs, patches of heather, large fine sandstone boulders, and locally a thick layer of peat on the ground. All oaks examined seemed closest to *Q. robur* L. (Q. ped.) but are probably hybrids with *Q. petraea*, as they have rather short peduncles. Leaf form is variable. The leaves are badly eaten by caterpillars which roll leaves up into a tube about the size of a cigaret in which they live. Ants pasture very large dark brown aphids on the twigs.

Locally large patches of *Pteridium* cover the ground under the oaks and pines.

July 17 - Bet. Nemours and Louppes sur Loing. General landscape is dominated by trees in rows and patches, steep slopes wooded, poplars on flats, fruit trees around houses.

More or less the same bet. Louppes and Montargis. *Robinia* very common along the roads, in edges of woods, etc.

South of Montargis the landscape becomes more open, dominated by grain, beet, alfalfa fields, etc. more level or gently rolling. Farther on, near Nogent sur Vernisson, trees become dominant again. Two methods of forest management to be seen here - clear cutting and leaving seed trees some yards apart.

South of Nogent heather and birch appear for a short distance. Said to extend commonly as far west as Orleans.

*Castanea* is common here, flowering very heavily, a few dead trees seen, perhaps first inroads of blight.

Just north of Briare is a large forest mostly rather open. South of Briare vineyards become common. Also some poppy fields ~~light~~ <sup>yellow</sup> flowered raised for oil.

The Loire River between Briare and Nevers, is broad and has a conspicuously braided channel full of sand bars and flats, running through a broad flood plain with the higher land at its sides, intersected into low rolling hills. The part of the flood plain nearest the river, especially on the west side, is occupied by a low irregular very thick brushy forest, principally of *halix* and *Populus*, the latter making emergent trees from the general low story of willows and young *Populus*. Sand bars of different ages are covered by brush of different sizes. Those nearest the main channel are mostly bare.

The rest of the flood plain is a mixture of cultivated land and marsh with scattered trees.

mostly *Populus*. *Viscum* very noticeable on the *Populus*. The fields in this plain and on the low hills on the east side are separated by hedgerows in which a *Prunus* is common, also various trees. Roads lined by rows of *Platanus*, *Populus*, etc. Fields very colorful with *Papaver*, *Hypericum*, *Centaurea*, *coronilla*, *Onobrychis*, etc. Vineyards very common on low hills at edge of flood plain. A special dry white wine made at Pouilly. The braided bed of the river very wide at Château appearing as much as 1 km.

Above this, in the vicinity of Trosanges, and south in valley of R. Allier, to St. Pierre there are grain fields, pastures and some woodlots. The fields are separated by hedgerows. Much hay produced here.

South of St. Pierre is more or less the same, the terrain gently rolling. Approaching Moulins hedgerows become a little less common.

July 18 - Between Moulins and Châtel de Neuvre hedgerows are really the rule. Mostly of *Crataegus*. South of Châtel de N. they

become scarce. Vine yards are abundant.

July 12 - Clermont-Ferrand.

Puy de Dome is a volcanic remnant or cone 1465 m. high. It is mainly of a light gray rather hard rock, said to be extruded; at least no signs of a crater at top, though other cones in neighborhood have well-marked craters.

On gentler slopes just below steep part of mountain there is a thin vegetation of grasses, *Luzula*, *Galium verum*, etc. with shrubs and patches of *Cytisus*, *Calluna*, etc. In places *Cytisus* is almost continuous. Small forests of *Betula*, a few *Quercus*. Small plantation of *P* young *Tinus sylvestris* and *Picea* on east side at perhaps 690 m. In openings, *Calluna*, *Digitalis purpurea*, *Pteridium*, *Urticum*, *Achillea*, *Galium mollugo*, *Rubus*, *Centaurea*, etc.

*Pteridium* is dominant over large areas.

At about 1050 m. <sup>and above</sup> *Corylus* is locally dominant in openings and in spruce forests, here only near openings, and road *Scabiosa*, *Brachypodium*,

Valerians seen along road at 1100 m. and up to 1200 or 1250 m. On south side is a well developed spruce forest with, with some *Betula*. At 1160 m. some *Fagus*. In openings *Myosotis*, *Ericium*, *Epilobium*, *Trifolium pratense*, *T. repens*. In the well-grown spruce forest, above 1160 m. there is only a poorly developed herbaceous layer - some *Galium*, *Geranium robertianum*, etc. Mostly a moss cover, only a ground. At upper altitudes around toward west side this forest is partly dead - from exposure to wind? It is lacking on west and north sides. Above it and on sides where it is lacking is generally a meadow, colorful with flowers - *Cytisus*, *Galium*, *Alchemilla*, *stellaria*, *Viola*, *Achillea*, *Vicia*, *Polygonum bistortum*, *Phyteuma*, *Geranium*, *Lilium*, *Ranunculus*, etc. On west slope this is invaded by a broad-leaved forb (lvs. white beneath) forming scattered shrubs (m. tall).

On rock outcrops a mat of *Cytisus* and *Calluna* covers the peaty ground between the rocks.

ff

July 8 - south of Muret-Lheraud, over the first 1000' we see some old lava, then open country on a gritty soil either of a decomposed granite or a lapillate volcanic material. Here are grasses, *Cytisus*, a few small junipers, small patches of heather, scattered pines and birches. South of this are meadows, hedges, patches of thicket, birch woods, coniferous woods, etc.

On lava flow, called *Chaine d'Aydat*, there ~~is~~ are *Calluna*, various grasses, *Silene*, *Dianthus* and various other flowering herbs, *Paronychia*, ~~scattered~~ *Cytisus*, *Génista alata*, scattered *Juniperus*, *Corylus*, planted *Pinus* and *Picea*. This flow is said to be upper quaternary. This flow dams the *Veyre R.*, forming Lake d'Aydat.

South of the lake on the slopes are fir forests, then an irregular rolling upland with meadows, patches of *Cytisus*, ~~bad~~ hedgerows with *Lambucus* conspicuously in flower - these hedgerows

mostly just pieces, not enclosing anything. The meadows have many flowers out now. They are both mowed and pastured; some grain is grown, not yet nearly mature; some coniferous plantations; both sheep and cattle are pastured here. This surface seems largely made up of old basalt flows (tertiary, miopliocene?). Where a broken off section of one of these shows at the conspicuous columnar but the columns are badly shattered. This is true across the valley from Muret, where such a section was examined and rock asplenium collected.

To the south some snow patches still persist on the mountain slopes.

At Muret there is pine forest and beech forest in the canyon. The pines are some of them very short needled may be *P. cembra*. Up the canyon of the *Couze de Chambon* from Muret is Lac Chambon (877m). Here is a locality for beds of "cinerite" and "diatomite" (see p. 80).

July 18 - La Cassiere, 11 km.

s.s.e. Clermont-Ferrand.

sloping meadow

35773 *Rhinanthus hirsutus* Lam.

very common

825 m.

74 *Luzula*75 *Bryza media* L.

occasional

76 *Scabiosa*

common

77 *Genista alata*

common

78 *Agrostis*

common

79 *Campanula*

occasional

80 *Myosotis*

occasional

corolla bright yellow,  
bracts pale green.flowers bright ~~rose~~ purple

flowers bright yellow.

f. flowers white.

flowers violet-blue

July 18 - Cheire d'Aydat,  
13 km. ~~s.w.~~ of Clermont-Ferrand  
on rough lava-flow  
with pines, <sup>Junipers</sup> and other  
conifers and ~~conifers~~.81 *Vernicia officinalis* L.

occasional

f. deep lavender.

82 *Helianthemum*

common

flowers bright yellow.

83 *Jasione*

occasional

blue-lavender

84 *Asperula cynanchica* L.

common

flowers pinkish

85 *Melampyrum*bracts maroon, flowers  
red with yellow lip.

68 1954 France

35786 *Dianthus*  
2 occasional  
2 87 *Galium*  
common  
1 88 *Paronychia*  
occasional  
1 89 *Cystopteris fragilis*  
uncommon  
1 90 *Campanula*  
occasional  
1 91 *Valeriana officinalis*  
common  
1 92 *filere*  
occasional

July 18 - ~~mouth~~ of Murols

22 km. S.S.W. - Mount-Fauver  
in crevices of old  
shattered basalt flow

2 93 *Asplenium trichomanes* L.  
common  
2 94 *Asplenium germanicum* Wein.  
common  
2 95 *Asplenium ruta-muraria* L.  
common  
1 96 *Gnaphalium*  
occasional  
2 97 *Helleborus foetidus* L.  
common at foot of cliff

Dept. Puy de Dome

69

flowers ~~deep rose~~  
bright crimson - pink.  
flowers white  
flowers whitish.  
flowers ~~reddish~~  
violet - blue  
flowers pinkish white  
fls. white.

900m

west

July 19 - Bessolles

meadow on granite - ad

1000 m. ±

35797 *Viola*

very common

~~99~~ *Viola*

seasonal

99 *Viola*

occasional

35800 *Malva*

common

same

on steep road cut

01 *Digitalis lutea*

common

July 19 - east side of Lac Pavin

1275 m.

02 *Orchis*scattered in woods and  
meadows, uncommon03 *Arnica*occasional in meadow,  
with some heather04 *Galium*

in meadow with heather

05 *Neottia nidus-avis*rare in mixed woods,  
mainly beech.06 *Anemone*

common in sloping meadow

flowers very dark  
purple with yellow  
spot on lower petal.- flowers dark purple  
with lower petal  
pale, marked with  
dark.

- flowers rose-purple.

flowers pale yellow.

root-fleshy; petals greenish,  
sepals white, spur green.

flowers orange-yellow.

flowers white.

flowers dull light brown.

flowers whitish,  
marked inside with  
green, outside with purple.

35807 *Ranunculus*

common in meadow

10 *Vaccinium myrtillus*  
common in meadows  
with heathley (also in  
forest)

29

July 19 - Slopes of Puy de Montchal  
above Lac Pavin.10 *Ajuga genevensis*?  
common in *Picea* forest

10 Anemone

occasional in *Picea* forest11 *Maianthemum bifolium* (L.) Schm.  
common in dense <sup>Picea</sup> forest12 *Lamium galeobdolon*  
occasional in forestJuly 19 - west side of  
Lac Pavin

in beech forest

1200-1270 m

13 *Dryopteris phegopteris*  
on rocks above trail14 *Dryopteris linneana*  
common on steep slopes  
and rocky places.15 *Geranium*  
common on steep slopes16 *Lychnis flos-jovis*  
common along trail17 *Luzula*  
common on steep rocky slopes18 *Epilobium montanum*  
common along trail

flowers deep yellow

low patches; fruits  
immature.

flowers blue

flowers clear white.

flowers white.

flowers yellow,  
~~as~~ lower lip marked  
with red-brown.rhizome shallowly buried  
creeping, fronds light green.

flowers deep magenta

flowers crimson

small tufts

flowers rose.

35819 *Lysimachia nemorosa*  
common along trail

✓ 20 *Phyteuma spicatum* L.  
common on lower slopes  
near lake

✓ July 19 - top of Puy de Montchal,  
south of Lac Pavin.  
open heath with *Juniperus*,  
*Vaccinium* and *Calluna*

✓ 21 *Polygonatum verticillatum*  
common locally

✓ 22 *Vaccinium uliginosum*  
common locally

✓ 23 *Stellaria palustris*  
occasional

✓ 24 *Taris quadrifolia*  
rare along trail

✓ 25 *Galium*  
common

July 19 - just below Lac Pavin

✓ 26 *Linaria striata*  
road bank

✓ 27 *Orchis conopsea* L.  
rare in moist spot

✓ 28 *Orchis maculata* (?)  
occasional, moist spots

1411 m.

✓ prostrate, flowers  
yellow

- root thickened, soft  
milky; flowers white.

erect, ~~with~~ rhizome  
deeply buried among  
roots of shrubs.  
forming patches; leaves  
bluish green.  
flowers white

<sup>and rhizome</sup>  
roots yellow; flowers  
white.

1190 m.

flowers mauve with  
darker stripes, palate  
yellow.

flowers crimson

leaves spotted with  
bronze; flowers lavender  
with deep purple spots.

July 19 - bog, km. n.e.  
of Lac Chauvet  
open bog with deep  
peat, ~~morning~~ water  
in lowest spots

15229 *Polygala*  
slope above wet part of bog  
2 30 *Polygonum bistortum*  
common in wet peat  
3 31 ~~Eriocaulas~~ *Eriophorum*  
common in wet peat  
2 32 *Salix laevigata*?  
occasional in wet peat  
2 33 *Potentilla (canescens) palustris*  
colony in flowing water  
2 34 *Carex*?  
common  
3 35 *Galium constrictum*  
common  
wooded bog  
1 36 *Orechis maculata*  
common in open places  
1 37 *Galium*  
cs. mn in open places  
1 38 *Polygala amara*?  
rare on peaty slope above  
bog  
3 39 *Cuprinasia*  
local on peaty slope  
above bog  
3 40 ~~in wet peat~~ *Pedicularis*  
in wet peat

flowers bright deep purple.  
even, flowers pink

shrub 1 m. tall.  
flowers maroon  
densely caespitose  
flowers white.

leaves spotted with brown,  
flowers lavender, marked with purple  
flowers white.  
flowers blue

flowers white, one red  
with black inside, petals  
yellow.  
flowers crimson.

July 19 - walking between  
Rochefort-Montagne and Rochefort-Montagne  
above Rochefort-Montagne

33941 *Pyrola media*  
steep bank above road  
42 *Corylus*  
steep bank above road  
43 *steraria*  
rare on roadside bank  
44 *Polygala*  
roadside bank, brown  
rocks.

July 19 - Jannat Dept. Allier  
45 *Onobrychis vicifolia* Scop.  
cultivated for hay

July 20 - Forêt de Bagnolé

46 *Galium palustre* L.  
roadside ditch  
north end of Forêt de Bagnolé  
47 *Centaurium*  
rare in edge of marsh

Allier

fls. leaves light green;  
flowers white, not  
second.  
- caespitose, fl. leaves  
white.  
- flowers white.  
flowers bright blue.

flowers rose-purple

flowers bright pink.

dated as at the base of the lower pliocene. The diatomite, especially, contains impressions of leaves and fruits, of which some were collected. *Fraxinus* is most common. The outcrop has been almost completely destroyed to make a parking lot. (for reference to this see Boulay, Bull. Soc. Geol. Fr. 21:97, 1893; Boulay, Flore pliocène du mt. Dore, 1-116, Paris; de la Vaux, R., + Marty, P. Nouvelles recherches sur la flore fossile des environs de Varennes (Puy de Dôme), Rev. Gen. Bot. 32:289, 1920; Juncq, J. Géologie de l'Auvergne, 1-372, Paris, 1940 - here, p. 200, mention 40 sp. plants and 50 insects, from which the beds are dated as base of lower pliocene above the La Banboule level, same level as the pumiceous alluvia of Ferestre. Very detailed geological map of region in 1/80 000 geological map of France, Clermont (166) and Brioude (175) sheets).

(Material sent to Washington via diplomatic pouch, courtesy of office of agr. att. at Paris Embassy, Dr. Hermann.)

Region between La Chambon and Bessolle - slopes wooded, valley flats cultivated. *Bambusa* very common and conspicuous in flower. Woods are mainly pine, some *Fraxinus excelsa*.

The pines may be *P. sylvestris*, though the leaves vary much in length and some may be *P. cembra*, etc.

Uplands around Bessolle are of same shattered basalt as on other side of mounds. Pastures, some areas covered by *Pteridium* and *Cytisus*. *Fraxinus* is common in hedgerows. More or less the same to Besse en Chandesse. Here there is a biological laboratory headed by M. Olivier - part of Université de Clermont.

The whole region is an exceedingly intricate complex of extrusive basalt flows, basaltic tuffs, andesites, of Miocene to late quaternary age, lying on a basement of older crystalline rocks.

There is a flora -

Herbaud-Joseph

Flore d'Auvergne, ed. 9  
1-638, Paris, Toulouse, Clermont-Ferrand.

1915.

southwest of Besse, along the Couze de Pavin is pasture with patches of beech forest in a sheltered valley with rounded hills.

Lac Pavin is a beautiful little crater lake, 20 m. deep, water deep green, surrounded by steep crater wall wooded by forest of *Fagus*, with on n.e. side, at least, some beech and some cypresses, esp. pine. Sparse herbaceous undergrowth on the slopes where forest is thinnest, more varied and luxuriant where there are rocky places or openings.

Outer slope is pasture with prostrate *Juniperus* and many flowers. *Calluna* comes in in overgrazed spots, apparently.

On south side of lake, on slopes of Puy de Montchal, is spruce (*Picea*) forest of trees about 3 m. tall, trees about 3-4 ~~dm.~~ dm. diam. 3-5 m. apart, lichen-covered, incompletely self-pruned - the branches dead and broken but still persistent. There is a thin herbaceous ground cover of scattered *Maidenhair*

1197 m.

\* \*

*Abies* and *Pinus*, etc. with a carpet of moss.

Puy de Montchal itself, 1477 m. high, is a round peak mostly covered by spruce and beech forest, some larch, fir, etc. mixed in, the openings either meadows with flowers and grass or heaths with prostrate *Juniperus*, *Vaccinium*, *Calluna*, *Rubus*, and many flowering herbs, e.g. *Potentilla*, *Tomentilla*

*Galium**Gentiana lutea**Marcissus**Factaria* (?) (blue)*Rumex**Polygonatum verticillatum*  
several umbelliferae, etc.

The peak itself is covered on top by such a heath. The peat is thick.

On the west side of the lake the beech forest is magnificent with large trees, many ferns and shade-loving herbs, etc.

bet. Lac Pavin and Lac Chauvet are rolling high meadows, boggy in places, with compact patches and clumps of beech forest. Low patches of juniper and corylus. *Gentiana alata* abundant in meadows. *Eriophorum* forming white patches in low spots. *Gentiana lutea* conspicuously with deep yellow flowers forms large colonies.

Bogs near Lac Chauvet with deep peat. *Calluna* abundant, man. edge incl. *Eriophorum*. Some peat has been dug out locally, standing and gently running water in lowest places.

West of Lake Chauvet the rolling meadow and is extremely rich in flowers. Basalt outcrops have *Pteridium*, brom., etc. Knobs of columnar basalt, patches of woods and brush esp. along streams, some scattered trees.

Above Labourboule and to Mont Dore are rather extensive spruce forests

with patches of meadow. North of Mont Dore are fir forests. Beyond this are three large rocks of columnar trachyte-phonolite, columns slender, surrounded by beech forest. Valley bet. Roche Tuiliere and Roche Lanadois is glaciated. From here through Rockefat-Montagne the road rapidly descends out of the high plateau.

In the valley are meadows and boggy patches of beech woods.

July 20 Forêt de Beaufort  
n. of Moret-sur-  
Loing  
Part examined are  
young forest.

The place is mainly  
oak, some beech trees  
5-8 cm thick, probably  
10 m tall, 1-2 m apart.

There are also a few  
*Populus tremula*.

The undergrowth of  
tree seedlings is here  
and there, local thickets  
of a *Rubus* with various  
leaves, not dense, though.  
Patches of *Pteridium*,  
spots of *Polytrichum*  
and other mosses.

Tufts of sterile *Deschampsia*,  
a little *Hedera*, *Convallaria*  
common locally, scattered  
*Viola*, *Mercurialis*,  
*Ronicia*. Mainly a  
layer of dry leaves.  
Some fleshy fungi,  
mostly *Scleraria*.

Another place  
forest about same size,  
predominantly beech.  
More *Hedera* but otherwise  
much less herbaceous  
ground cover. Very little  
*Deschampsia*, some  
*Polytrichum*.

North of this forest  
is a marshy  
area ~~at~~ along a  
small streamlet.  
some *Phragnum*.  
Bradly grazed. *Isimondia*  
*regalis* fairly common.  
*Rubus* thickets very  
hard to penetrate.  
possible to walk in  
marsh now, as  
there has been dry  
weather for a time.  
Very little standing  
water.

July 25 - out of Paris to south - generally partly wooded, especially on slopes, partly cultivated. To north and south of Thiverval and Montrouge are vast open fields, mostly of grain being harvested. Some sugar beets. A very few rows of trees and patches of woods. At Angerville trees become somewhat more evident but still the landscape is one of open wheat fields. Some alfalfa and beets. More common toward Toury and southward, but still dominantly grain fields. Around Chevilly the landscape becomes largely wooded but the woods are rather scrubby - young second growth with scattered seed trees. Still some large open fields around Cercottes. At Taras are plantations of *Pinus sylvestris*. Little or no wheat here to Orleans. Openings pastured, a weed, a orchard.

s. of  
Champer

edge of  
s. of Orleans

Just s. of ~~out~~ Orleans the first few vineyard. Miscellaneous cultivation and some woods. Roadside and banks and waste spot covered by young *Robinia*, burning thickets. South a little way forest becomes more general. some heather. Mostly oak, but birch common. Forest mostly scrubby, patches of *Cytisus* and of pines common. Some ponds, some areas of open fields. southward some patches of very good looking forest. also much that is mixed and irregular. Soil light gray. Pines more and more abundant, also birches and heather. Ponds and marshes more common, with *Nymphaea* and *Typha*, *Scirpus lacustris*. Large patches of *Pteridium*, esp around Vouziers. South of this, *Castanea* appears in considerable numbers. South of this broken woods but n. n. lined with thickets of *Robinia*. To Lamotte-Bertron and southward. More pine

birch and heather. Pale gray soil continues.

Bois de la Fusailler - fields separated by hedgerows and woodlots. Pines, oaks, birch, etc. Some rows of poplar, very noticeably infected with *Viscum*. Birch seems generally an early stage. Pines when dominant have open heather beneath them. Some open heaths.

Large uneven stands of birch esp. near L'Albis. Some birch wood piled up to fuel. More or less similar landscapes southward, heather more abundant, to Thieillay. South of here somewhat more cultivation. Fields separated by hedgerows.

Forêt de Vierzon - tall oaks, some areas of scrubby birch, ponds.

South of Vierzon considerable cultivation, fields sometimes separated by hedgerows, some forest. Generally much more fertile appearance. Some vineyards. Willows prominent, also poplars in flat bottom-land landscape of the valley

of Ernon R. Much cultivation here. S. of Reilly willows and poplars very abundant for a considerable distance, esp. along the river. Both are hosts to *Viscum*. Some marshy land and low pasture, cultivation fields separated by hedgerows with lines of willows or poplars. Willows mostly pollarded, light silvery green. Plantations of poplars very common near St. Léonard. Orchards common around Issoudon.

South of Issoudon the river leaves the bottom-land and crosses a slightly higher gently rolling calcareous plain, mostly covered by open grain fields, rather few trees. Some fallow land. Soil reddish brown, full of pebbles.

Around Neuilly. Pillows, hedge-rows and patches of woods become more common. Mixed oak etc. Some open large oak with thick growth of *Populus tremula* between.

toward Chateauneuf, patches of wood and brushy wet low spots become more common.

S. of Chateauneuf, mostly cultivated, largely grain but some vineyard, beet, alfalfa, etc. A few hedgerows, small orchards, rows of trees, but mostly open.

Then some patches of woods. Then broken wood, fields, hedgerows, etc. Then mostly wood, then fields with hedgerows. Then open grain fields or gray soil, sometimes with sometimes without hedgerows, occasional patches of wood.

All of this part rolling land. Proportion of forest varies. Occ. ravines and scarps. These brushy. Southward the land becomes rougher, to Chabenet.

South along the valley of the Creuse - valley bottom flat, with small fields, rows of trees, etc. Sides hilly, with vineyards, small fields, hedgerows, patches of brush and woods. Southward rolling land, grain fields

pasture, hedgerows.

Some vineyard, patches of woods, mostly of young second-growth with scattered seed trees. Near Eguyac is a large patch of woods.

From Argenton through Eguyac and south to St. Sébastien the nr. climbs a considerable grade.

The plateau around St. Sébastien is in pasture and misc. cultivation, fields separated by hedgerows and rows of trees. Soil gray-brownish. Big oaks and other decid. kind, incl. considerable chestnut.

Grade down through La Fontenaine and beyond still fields, hedges, patches of wood. Greener here than farther north. (Photos both north and south of La Fontenaine, hedge, etc.) Landscape more and more dominated by trees. Fields 1-3 acres. Country gets more hilly.

S. of St. Pierre with woods largely made up of chestnut, Ravine of la Gartempe

very attractive, with young birch woods on one side, beeches on north.

South of this mixed cultivation with small fields, hedges, large areas of forest. Country quite hilly - hills 600-680 m.

Woods have fair % of chestnut - heavily blooming and just past blooming.

Higher hill are wooded around ~~Levada~~ <sup>Levada</sup> ft. Lupine, dominantly chestnut. Most of these hills are wooded, rolling ground cultivated, to La Jonchere and beyond. I. of here

not so hilly but still much of the land is wooded esp. with chestnut, much of which is coppiced - probably for bark. Valley around Ambazac mostly cultivated but many patches and rows of trees. South of there, more low wooded hills.

South of Limoges - Vallee de Vienne rolling hills, mostly cult. with rows and patches of trees.

Trees along river. Some steep slopes <sup>a bit</sup> covered by heather. Hedgerows between fields, fruit trees around houses.

As everywhere, Robinia on river. cuts and banks, but here rather locally. Trees largely oaks and chestnuts.

Near Beynac some fair sized areas of forest. South of the Périgord common in partly wooded slopes.

Oaks in this region frequently have a tall straight trunk and small umbrella-shaped crown, and all along the trunk a bushy cylinder of shorter branches. Probably the result of removal of lateral branches after tree has reached full height.

R.R. climbs out of valley onto a rather rolling plateau. Largely cultivated - fair sized fields separated by hedge rows with trees (smooth oaks) grain and alfalfa.

Vic. of Nevers.

South of Necon some patches of wood, largely chestnut. Patchwork of fields separated by hedgerows with oaths. Some patches of Ulmus, *Erica*, *Cytisus*, esp. on steep cuts and hill tops. Near Lafarge some patches of chestnut coppice on low hills. *Pteridium* abundant in waste places, road cuts, etc. Some patches of fairly good forest, mostly chestnut, s. of La Farge. Except for areas of wood, same pattern of cultivation and hedge continues southward, but chestnut coppice areas are more abundant. Land becomes less hilly and more rolling toward Bussiere-Galant. South of this a mixture of chestnut coppice and mixed cultivation, with chestnut predominating, less so toward La Coquille. S. of La Coquille *Ailanthus altissima* is established along the r.r. for about 100 m. S. of here a few dead chestnut trees. Little or no coppice, some areas of heath, brown birds.

etc. gorse, aspen, etc. n. of Marvalieres large open areas of bracken, gorse, heather just s. of it. ~~400 ft~~ Interspersed with this areas of cultivation and of scrubby forest. Extends to tunnel. South of tunnel land seems much more肥沃 (fertile) and more thoroughly cultivated. Little forest, no heath, to Thiviers. More *Ailanthus* just s. of Thiviers. South of this largely cult. but some thin forest mostly in with chestnut and oak undergrowth. This with patches of gorse, becomes more or less dominant southward, ~~then~~ ~~now~~ some cult., esp. vineyards, maize, pasture ~~now~~ toward Nepondes. F. of here, walnut trees common, some vineyards, pine forests on hills or knolls. Some heaths. Then much scrubby forest of oak and chestnut with scattered taller pines. Some good pine forest, but always with under-

story of hardwood. Near Lignac some fairly good oak-chestnut forest. Still some pine. Walnut around village. Misc. cult. esp. maize + pasture. Willows and poplars in flat valley in pasture.

S. of this some vineyards, grain fields, patches of pine woods. misc. cult. same flat valley with pastures, willows + poplars. Phragmites in wet places. South of this, near Agonac, some rather open country pasture and grain, with some walnut trees around fields, etc. Pulp wood produced in this general area. same flat valley with willow + poplar to south side. Misc. cult., vineyards, scattered walnuts, patches of woods, pine or oak or mixed.

In this general area much maize, grain, alfalfa, some beets, potatoes + *Helianthus tuberosa*, mustard, more pasture. Some heath on slopes. Some slopes with junipers, near Chateau-l'Évêque. Much pulp wood here.

becomes more hilly and more wooded to south, pine and hardwood.

Some eroded slopes. Valley bottom flat, cult.

Same general pattern as Perignac. East of Perigord hills are wooded, some s. slopes open with small junipers. Woods are pine being replaced by hardwood, or ~~scrubby~~ rather scrubby hardwood.

Flat valley bottoms and gentler slopes cultivated. Some fields separated by hedgerows, others not. At Nivernac. East of this the hills become ~~less~~ lower and with more open meadows though still generally wooded. Woods denser on north facing slopes. Much pasture in valley bottoms and lower slopes.

Beyond here an extensive fir stand a year or two old in which sparse scrub appears to have been burned. *Pteridium* now dominant between the old sticks.

*Pteridium* generally common has in unused open land except on calcareous slopes dominated by open Juniper and grass. *Pteridium* is ground cover in some a very young forest, and in open forest generally. Heather very local.

Toward Les Eyzies the hills become lower and partly open, partly wooded. Many calcareous slopes with scattered Junipers. Woods here scrubby mixed hardwood with scattered pines and patches of pine. Cliffs and rock outcrops more common.

are persistent from cultivation are common here, esp. *Ficus carica*.

The valley floor has the usual poplars and willows, many elms, and some *Acer negundo*. Cultivated fields. River lined with willow and poplar. Great masses of *Potamogeton* and *Ranunculus aquatilis* in river, the latter making masses of white bloom.

July 25 - Les Eyzies

Flat green river valley cut in flat beds of limestone which form cliffs <sup>in box</sup> <sub>side</sub> with broad dry ledges. The cliffs and ledges are either bare or covered by a xerophytic vegetation of *Quercus ilex*, several other species of forms of *Quercus*, *Pinus* sp. (, needles), *hedysarum*, *Prunus*, *Hedera*, *Viburnum lantana*, *Thymus*, *Acer monspessulanum*, *Cornus sanguinea*, many small labiates and other herbs, esp. umbellifers and legumes, several *Campanulas* and other *Campanulaceae*.

In crevices in cliffs esp. where overhanging and shaded, *Adiantum* is very common. In grottoes it is abundant.

On the cliffs *Hedera helix* forms great masses, clinging very closely to the rock, lower stems many cm. thick. An *Orobanche* is common, possibly parasitic on the *Hedera*. Quite a few plants that

July 25 - Les Eyzies  
dry limestone ledges  
on cliffs, in scrub vegetation

335848 Quercus ilex  
3 49 Quercus ilex  
3 50 Quercus ilex  
2 51 Quercus  
2 52 Quercus  
2 53 Quercus  
2 54 Teucrium  
local in full sun  
2 55 Parietaria  
very common in crevices  
1 56 Teucrium  
occasional in full sun, crevices  
2 57 Helianthemum  
rare, in full sun, crevices  
2 58 Asperula  
common  
3 59 Teucrium  
local in full sun, crevices  
3 60 Adiantum  
abundant on shaded cliffs  
and in small grottoes  
2 61 Barnolus?  
occasional on shaded rocks  
in

July 26 - same

2 62 Acer monspessulanum  
common in thickets on ledges.  
1 (63) Quercus ilex  
2 (64) Quercus ilex  
common in thickets on ledges

shrub 2.5 m. tall, gray.  
tree 6 m. tall.  
shrub ~~2.5~~ m tall.  
small tree 4 m. tall.  
small tree 4 m. tall  
shrub 2.5 m. tall.  
flowers whitish; plant  
pleasantly aromatic.  
stems procumbent to  
weakly ascending.  
flowers rose purple.

from root crown;  
flowers white.  
flowers dull yellow.  
fronds hanging.

leaves delicate, light green,  
flowers white.

small crooked tree, 4 m. tall.  
small tree, gray-green.

35865 *Quercus*2 common in thickets on  
dry ledges

1 66 ash

rare in thicket on dry ledge.

2 67 *Orobanche*common (possibly parasitic  
on roots of *Hedera*) at base of cliffs1 68 *Equisetum*

common at bases of cliffs

July 26 - Vézère River at Les Eyzies

2 69 *Potamogeton*abundant in slowly running  
water several ft. deep.3 70 *Ranunculus aquatilis*abundant in slowly  
running water several ft. deepsmall tree, more  
finely lobed leaves from  
sprouts on trunk.

flowers tan to purplish.

erect, forming large  
colonies, up to 1 m. tall.

leaves floating.

leaves submerged,  
flowers on pedicels  
several cm. above surface,  
white.

July 26 R. Vézère below  
les Eyzies - steep  
limestone slopes at foot  
of cliffs on s.w. side -  
of scrub-forest of  
*Quercus ilex*. Slopes  
on other side low forest  
of deciduous oaks, etc.  
Valley bottom with  
cult. fields, walnut  
trees, rows of willow  
and poplars - 2 sp.  
Much *Ailanthus* locally.

At Le Bugue the valley bottom  
is much wider. Some  
vineyards, misc. cult.  
Hills on both sides rather  
bare except for juniper scrub.

Below this, lower slopes  
of hills cultivated, upper  
slopes wooded, mainly pine.  
Valley floor very flat.

Then Vézère joins Dordogne.  
Hills here, at Le Buisson, are  
more gently rounded, partly  
cultivated to tops, some woods.  
Up this valley, this almost  
entirely misc. cult., some  
trees mostly in rows except  
for belt of river forest  
of *Salix*, *Ulmus*, *Populus*,  
*Quercus*, *Fraxinus*, etc.  
and some small poplar  
plantations.

Grain, maize, tobacco,  
beets, alfalfa, a few grapes,  
some *Helianthus tuberosus* are  
principal crops noticed.  
Same to Diors en Perigord.  
After this the r.r. leaves  
the valley and climbs  
up a small south tribu-  
tary where there are on the  
n. e. side, again some  
dry rock slopes with  
junipers, on s.w. side  
woods of pine and hardwood.  
Around Belvès cultivation  
and pasture goes almost <sup>or quite</sup> to  
tops of hills. Valley bottom  
narrow, cultivated. Hills  
above this gentle but  
rather high. Up the valley,  
toward Le Got the  
valley becomes more  
wooded, principally  
with pine and an  
understory of oaks, the  
oak dominant where  
pine has been removed,  
absent where pine is too  
thick. Occasional chestnut  
and other broad-leaf trees.  
*Robinia* abundant along  
r.r. Juniper in thin  
places in pine on s.w.  
slopes.

Descending valley of la Lemance from le Got pattern of cultivation, pastures, and patches of woods. oaks & pine with oak understory. Willow along the ditch or rivulet in valley bottom. Hills rather gently rolling. Some hedgerows of Crataegus, etc. Thus to Villefranche du Perigord, where woods have become dominant. Below here hills largely wooded, flat valley bottom cult. with rows of poplars. Some bare limestone cliffs and steep brushy limestone slopes. Below la Lemance the valley opens out somewhat and the hills become lower-cult. part way up, scrub or woods on slopes and tops. Misc. cult. a few patches of poplar, some hedges in valley bottom. At St. Front it narrows again and hills are brushy to base. Some forest of oak. Some rather bare steep slopes, badly eroded. At Cuzorn there are cliffs along the valley bottom, but hills are otherwise gentle. Generally

somewhat open and scrubby, some juniper. Some wooded with pine. Some slopes cultivated. Below this the valley widens out and there are flat a gently rolling cultivated plains 1-2 km. wide. Gentle wooded slopes to the sides. Some vineyards, some hedgerows, some pasture, some rows of poplars, misc. cult., narrow strips of mixed wood along stream.

Below Monsempron-Libos the valley (lot V.) is much wider - flat. Misc. cult. Vineyard, orchard, tobacco, grain, maize, vegetables, pastures. Narrow riverbank forest, row and some patches of poplar. Lower down are limestone bluffs along river, apparently sides of low flat topped erosion remnants. Tops of hills along valley wooded, slopes cult. and pasture. Around Penne the country becomes broken

and hilly. Gentle slopes cultivated or pastured, some vineyards. Steeper slopes and knobs wooded except some rock slopes and cliffs which are bare or brushy. Grain, alfalfa, vineyard, pastures, some hedgerows in flat bottom. Climbing up a winding valley ~~downward~~ de laatige toward Hautpays-Auradou this pattern ~~continues~~ continues with grain and pasture becoming dominant. Thickets of Robinia along nr. Knobby country. More patches of woods, mostly oak & oak + elm toward head of valley. Long tunnel. After Laroque hills with patches of woods and pasture, some cultivation - vineyards, potatoes, beans, grain, etc. increasing downward. Some limestone slopes with ~~spars~~ juniper. Hills become gentler, more rolling, tops tend to be wooded. Some hedgerows, more downward. Valley widens and hills become lower toward the Garonne.

Valley bottom is misc. cult. hill slopes mostly pastured.

At Agen are white cliffs, probably limestone. Houses built into excavations in them.

Garonne Valley has very broad flood plain with patchwork of misc. cult. grain, ~~as~~ maize, vineyards, vegetables of various sorts, alfalfa, pastures, with some hedgerows and rows of poplars and willows. A few small patches of poplars. Along the banks of the Garonne are thickets of willow and rows of poplars. Orchards and rows of fruit trees in fields of other things. Apricots and peaches. Some small patches of mixed poplar, willow and other broad-leaved trees.

The small size of the plots, mostly an acre or two or less is striking. Trees are an important part of the landscape, even where the entire countryside is cultivated.

up river from Valence more  
or less same pattern. River  
valley very broad here.  
some other trees besides  
poplars along road, e.g.  
*Platanus*, oak, elm, linden.  
Canals lined by trees, also.  
Slopes n. of valley  
wooded along Tarn R.,  
then cult. with vineyards  
at Moissac. Patches of  
young *Populus* forest in low  
spots along R. Tarn. Willows  
felt rather narrow.

Above the Tarn, the  
Garonne V. is so wide  
that the hills on the side  
are not visible from the  
train. Castelsarasin.  
Miscellaneous cultivation,  
trees prominent in landscape.

July 27 - south from Toulouse  
the valley of the Garonne  
is largely in grain (already  
harvested) and some alfalfa  
and vineyards - very flat  
country, rows of trees and  
a few wood-lots, but becoming  
less far a few km. Then  
more with some patches.  
A low but sharp escarpment  
on east side. Trees esp.  
along watercourses and  
on escarpment, also around  
houses. Escarpment becomes  
higher, more broken, more  
wooded. Landscape on  
flats below more character-  
ized by trees southward  
until just before Langages  
the landscape is quite  
green in spite of brown  
stubble fields. Vineyards  
more abundant about  
Langages - no, 75% or more  
of cover here. Here the  
escarpment is less  
sharp and less wooded.

Near Carbonne an  
escarpment to the west  
becomes visible. Vineyards  
less abundant, alfalfa  
and maize more so, some  
grain fewer trees, some  
hedgerows but not many.

Then rather open  
flat land, large  
fields and large vineyards  
southward again,  
more trees and more  
vineyards, some solid  
patches of Robinia and  
of Cyrtinus. A few hedgerows  
and many rows of trees.

Hills in distance on  
both sides partly wooded,  
partly cult. and meadow.

S. from Cazères, more  
less the same pattern,  
less vineyards. Grain  
being harvested.

At Martres-Tolosane  
the too flat valley floor  
narrows rapidly,  
rather high wooded  
hills approaching on  
both sides. Woods mostly  
hardwood, dense but  
appearing rather scrubby.

Crossing the Garonne  
s. of Bouscous - narrow  
belts of willow on both  
sides.

Follow east of the small  
range called Plantaud -  
Petites Pyrenees - scrubby  
and rocky with cliffs  
and steep slopes. Valley  
here very green with

pastures, abundant trees, hedgerows, mixed cult. - grain, maize, potato. Large areas separated by hedgerows, these areas divided into many small patches of different crops.

Labarthe - Ward southward same pattern high wooded hills to east, low ridge to west. Hedgerows more abundant, with trees.

R.R. skirts base of w. ridge which is wooded with small pastures dominant in some areas. Mixed broadleaf woods, some very fine old trees locally.

Toward St. Gaudens hills are cultivated. Across valley are high, densely wooded hills, foothills of Pyrenees.

After St. Gaudens the valley abruptly widens - is green with broad meadows and pastures, some grain fields, few trees, some very low hedgerows, a little cultivation of maize, beets, potatoes, etc. Vineyard locally around villages.

Foothills of Pyrenees rise very abruptly from flat valley floor. Further on less pasture, more diversified cultivation.

Foothills thickly wooded, but showing evidence of vertical strips of different management stages - done in narrow vertical bands which seem to be clear cut.

Montrejean - Gourdan - Polignan - 420 m.

From here, still following the Garonne, but climbing, between brushy ~~hills~~ or wooded hills. The higher Pyrenees visible above the hills to the south (n. goes west from Montrejean).

Along rr. or on slopes n. of Garonne V. thickets of Robinia, patches of cultivation. Valley very green, cultivated fields, patches of wood, hedgerows, rows of trees. Trees dominate landscape. Grain fields are yellow. Trees mainly ~~oak~~ oak + chestnut, even in valley floor here, though willows + poplars ~~oak~~

not absent.

Then n. emerges onto a broad open plain, a vast alluvial fan with patches of trees, pasture and cultivation, some hedgerows.

at 610m. Lannemezan - The Plateau de Lannemezan is the great alluvial fan which is crossed by n. east to west.

Rows and patches of woods, pasture, cult. fields, areas of scrub, and broom. Then vast open areas, mostly in pasture, only a few very stunted trees - to Capvern

From here "descends the slope of fan which is dissected. Steep slopes wooded, gentler ones pastured, more level places grain fields. Fields and pastures separated by hedgerows. Some vineyards, some fine patches of oak woods.

Dissection becomes deeper as n. goes down a rather steep grade.

Lower down extensive slopes covered by scrub and brackens

Then flat bottoms of ravines wider out and cultivation becomes more general, with grain, vineyards, maize, potatoes, etc. Poplars and willow appear, esp. along streams. Grain being harvested or ready to harvest.

To Tournay - here flat valley bottoms as 1 km. or more wide - cult. with ~~but~~ some rows of trees and hedgerows.

Tarbes - 320m.  
July 28 Tarbes - Ampeauille flat valley bottom, misc. cult. many trees.

Valley of Adour R. - misc. cult. some vineyards, rows of trees, fruit trees around villages; mostly grain and maize, some potatoe, a little alfalfa, beets, etc. Small patches, carefully tended. Center of valley with few houses or trees, both more numerous to both sides.

Near Vielle - Adour the valley starts to narrow rapidly. The hills on both sides are partly ~~wooded~~ wooded, partly cult. partly pastured.

Maize mostly planted in rows, but ~~large~~ <sup>many</sup> patches seen below Ordigan planted in hills with beans in each hill.

Some patches of chestnuts on hills, but mostly mixed thickets, *Alnus*, *Robinia*, *Betula*, *Fraxinus*, *Quercus*, etc.

auto

July 28

Bagnères de Bigorre - in valley of Adour R. surrounded by luxuriant cultivation and the ornamental vegetation in the town is luxuriant and varied. The east slope of the valley above the town is very steep, rocks, with cover of low scrub. The w. side is more gently sloping and is partly cultivated, partly wooded, but mostly hay meadows.

Well above the town, at 1000m. or more, the walls of the valley tend to be covered by a dense forest of beech. Whenever this is bounded by meadows the transition

is very abrupt. The effect is of dense masses of dull dark green against the bright green meadow. Upward this cover becomes almost continuous.

At perhaps 1500 m. the beech becomes mixed with fir and spruce, these becoming dominant. This belt is perhaps 200m. wide and the trees are conspicuously lichen-covered, indicating at least a high incidence of fog at this level. Dr. Roche (1954) confirms this, saying that clouds are commonly encountered at these altitudes. *Usnea* is especially conspicuous hanging from the limbs of the conifers.

Above the spruce-fir forest there is meadow with a dense turf of many species. This is prominent around La Mongie, at the base of the Pic du Midi "Teleferique" or cable-way. Above this on rocky crests and outcrops are scattered dwarf pines (*Pinus mugo*) up to about 2300 m.

July 28 - Pic du Midi de Bigorre - trip by overhead cable from 1760 m. at La Mongie to sumn it.

This series of canyons, cliffs and slopes is extremely rugged, with rocks outcrops and talus in great expanses. The rock is a folded series of beds of limestone and schist. The folding is intense with the "wave-length" of the folds varying from several cm. to 100 m. or more. Some shattering, shearing and <sup>minor</sup> faulting also.

Talus is generally grassy except where rather coarse, where it has a low discontinuous scrub of Rhododendron perhaps several dm. tall, low rounded flattish clumps. Rhododendron also covers some rocky outcrops.

Everywhere there is the close pattern of sheep grazing paths - there might be taken for the result of intensive frost action and solifluction, were it not for the presence of numerous sheep even in seemingly inaccessible places on tiny

6 Taquet

bits of talus.

The only woody plants seen larger than the Rhododendrons were a scattering of small pines (*Pinus uncinata*) along the sharp rocky crest on which the "Midway" station of the cableway is situated. There are stunted trees only a very few m. tall and, though they form a conspicuous strip along this crest at about 2300 m. are so scattered as not to form any sort of forest.

The Pic proper is a very precipitous spire of rock 2857 m. high (lat.  $42^{\circ} 56' 12''$  N, long.  $0^{\circ} 8' 32''$  E), mostly mesozoic calcareous rock, bluish and massive interbedded with shists, severely folded.

Annual precipitation about 2.70 m., average of 4 m. snow in winter; snow storms have been recorded every month (e.g. possibly July), severe ones until May and sometimes again in September, but generally good weather till

sometime in November, heavy and frequent electric storms especially in May & June.

Although the talus of the middle slopes and even the rock outcrops, are covered by a rather continuous turf or heath, near the top there are principally isolated clumps, tufts, and cushions on the talus on ledges and in crevices. In a few gently sloping grassy spots the vegetation is more or less continuous, but only very locally. All species seen except

~~are~~ are low, depressed or compact in habit. Most ~~are~~ either densely pubescent or fleshy.

In the schistose areas the flora ~~was~~ is more restricted than on the calcareous ones, but most of the species from the schist are also to be found on the calcareous soil. This is probably because of the small areas and close proximity of one to the other and the movement of soil from one

to the other.

The sheep even climb to the top of the mountain, where they are quite a nuisance, destroying the plants in the small alpine garden maintained by the botany dept. of the University of Toulouse, in connection with the Observatory.

In this garden they are attempting to bring together the high altitude plants of the Pyrenees and even some from the Alps. Also they are trying out some from much lower altitudes to determine their tolerance. M. Drussoant, the gardener in charge, says that this site is rather too high to provide ideal conditions for most alpine plants. Has some difficulty with some of them. They are also carrying on some biological and pharmaceutical studies, but on a very minor scale. Are installing a tiny geochemical laboratory.

July 23 La Mongie, Pic du  
Midi de Bigorre  
green meadows,  
closely grazed, on slopes

35871

*Galium*

very common, especially  
around rock outcrops

2

72 *Trifolium*

common, especially  
around rock outcrops.

2

73 *Jasione*

common

1

74 *Viola*

common on slopes  
near buildings where  
grazing is less severe.

July 23 Pic du Midi de  
Bigorre, near summit  
shattered limestone rocks

1

75 *Oxytropis*

common on <sup>rock</sup> debris

2

76 *Vernicia nummularifolia*

occasional on patches  
of <sup>rock</sup> debris.

1

77 *Arenaria*

~~common~~ common in  
crevices and on <sup>rock</sup> debris.

2

78 *Gentiana verna*

occasional on <sup>rock</sup> debris

2

79 *Androsace*

occasional on <sup>rock</sup> debris

1

80 *Iberis*

occasional on <sup>rock</sup> debris.

1760m.

flowers white

flowers rose-purple.

flowers purplish-blue.

flowers violet

2850m.

flowers deep purple.

flowers blue-violet

flowers white.

caespitose in small loose  
tufts; flowers intense blue.

~~fls~~ caespitose, flowers  
pinkish white.

flowers lavender; leaves  
sub-fleshy.

25821 *Geum montanum* Sch  
common locally on rock debris

2 82 common locally in crevices

1 83 *Potentilla rupestris*  
common on rock debris.

2 84 *Myosotis*  
occasional on rock debris

1 85 *Lotus*  
occasional on rock debris

2 86 *Festuca*  
occasional on rock debris.

1 87 common on rock debris

2 88 *Oxytropis*  
occasional on rock debris

2 89 *Pedicularis*  
occasional on rock debris.

2 90 *Statice (Armenia)*  
occasional on rock debris

1 91 *Carlina*  
rare on rock debris.

2 92 *Poa*  
common locally on  
fine rock debris.

1 93 *Fallopia*  
very local on fine rock debris

1 94 *Fallopia reticulata*  
very local on fine rock debris.

2 95 *Taraxacum*  
occasional on rock debris

small tufts; flowers  
bright yellow.  
caespitose.

flowers bright yellow.  
caespitose in small tufts;  
flowers light blue.

prostrate, caespitose, forming  
small mats; flowers  
deep yellow, with orange  
red ones occasional (perhaps  
old ones?).

forming dense prickly  
mats.

caespitose; flowers  
deep rose-purple.

caespitose; flowers pale  
yellow.

flowers ~~deep~~ maroon-purple.

caespitose; flowers rose pink.  
heads purple.

prostrate; leaves smooth,  
light green.

prostrate, leaves very  
rugose.

heads bright yellow.

July 29 - same - siliceous  
schistose rocks.

35896 *Poa*  
common on fine rock debris.

1 97 *Draba*  
occasional in crevices

2 98 *Oxyria digyna*  
occasional in sheltered  
spots on fine rock debris.

† 99  
occasional on steep rock  
slopes, in crevices.

35900 *Hutchinsonia*  
common in crevices and rock debris.

1 01 *Corastium*  
occasional in crevices

2 02 *Chrysanthemum*  
common on rock debris

1 03 *Erigeron*  
rare in rock crevices

1 04 *Globularia*  
rare in rock crevices

1 05 *Papaver*  
rare in rock debris

2 06 *Galium pyrenaicum*  
common in rock debris and crevices

2 07 *Thymus*  
common on rock debris

2 08  
common on rock debris  
and in crevices.

1 09 *Artemisia*  
rare in rock crevices

1 10 *Linaria*  
rare on rock debris.

flowers yellow.

scapes erect; flowers  
dark red.

caespitose; heads bright  
yellow.

caespitose; flower white.

flowers white.

rays white, disk yellow.

rays lavender.

flowers blue-lavender.

flowers light yellow.  
foliage glaucous.

forming dense mats;

flowers cream-~~ad.~~ yellow.

prostrate; flowers  
bright purple.

flowers white (with #35911, 35912)  
(to pp. 144-145)

## July 14 - Toulouse toward Lacaussane

Almost flat valley of R. l'Her mostly cultivated, some pasture, very few patches of woods, some rows of trees, a few red-powdered vineyards but not much grain, maize, alfalfa, etc.

The low hills on the sides of the valley also show about the same pattern. Almost no woods.

A few sizeable patches of forest on the south side and in the valley floor below Villefranche le Lauragais.

Many more trees in vicinity of the town than away from it (usual condition).

Rows of poplars and *Platane* very common ~~at~~ south end of her. Valley narrow narrows rapidly.

Very narrow band of true woods along river banks.

Willows common. To the east the hills become less cultivated and more pastured, with patches of scrub and brown. Some bad erosion scars on the hills.

Pass imperceptibly over the divide bet. ~~Medoc~~ Atlantic and Mediterranean drainages, into the valley of R. Fresquel. Just before <sup>near</sup> Castelnau-d'Armagnac first cypresses appear. Planted for wind-breaks.

Rows of willows and poplars common. Valley intensively cultivated. Hills to south appear rather bare and drab from a distance. Planted conifers very common e. of Castelnau-d'Armagnac. Some mounds.

To north, in distance the low marshes of Montagne Noire, partly wooded.

This valley looks distinctly drier than that of l'Her. Grain is practically all harvested already. A few patches of young oak woods w. of Bram.

Toward Lacaussane vineyard become more common. Rows of trees conspicuous, esp. along canal. Marshy spots common along rd. Few planted conifers east of Bram. Vineyards become dominant feature of landscape toward Lacaussane.

S. of Carcassonne the land is all rolling and is all in vineyards mostly, not trained on wires.

Limestone hills are mostly scrub-covered but partly wooded. First *Spartium junceum* noticed just s. of C.

Juniper and small pines abundant on hills. The hills and scarps badly over-grazed and eroded. Much bare rock exposed.

Hills more common southward. Grazed. Some olive trees. General color of landscape drab, gray-green or gray-brown, except for bright green vineyards in flat valley bottoms. Spots of dark green on hills are low dense bushes. Patches of pines planted on some small hills. Cypress hedges fairly common, esp. in vicinity of towns, as *Leizignan* (Aude).

At L.A. the valley has become quite wide again. Mostly in vineyards. A few very low hills are pastured and have now planted pines. Some fruit trees scattered in vineyards.

Hills at sides of valley, very sparsely tree-covered, brush between. Badly grazed. Largest part of ground is scrub-covered.

R.R. follows a small valley into the hills. Occasional places planted to pine. Mostly low scrub and pasture. Much bare light gray rock exposed. Olive trees still rare but becoming more common near Narbonne.

Beyond Narbonne valley is wide and flat, almost entirely in vineyards, but many with fruit trees thickly scattered in them. Hedgerows and rows of poplars, willows, *Platanus* very common, esp. along the abundant ditches.

*Populus alba* common. Low spots frequent along r. with reeds, tamarisk, grass.

After a few km. most of trees disappear. Then vineyards become less frequent (but still the greater part of land) and more cult. esp. grain become more common. Proportion of vineyards varies greatly.

Hills at sides of valley, low grassy with bushes, overgrazed. Arable. A few planted conifers on tops.

Near Colombiers, valley becomes very wide again, mostly in vineyard.

To Beziers. - beyond on cut banks and eroded places a large gray bush like Alnifex. Rolling country, in vineyards. A few scattered pine and olive trees, rows of plane trees along canal and main road, some cypress wind-breaks. All the cypress in the region seems to have spine-like form.

A few small patches of heather and scattered small trees, some low hills partly wooded with scrubby oaks (?).

Then, most of irregularity in ground disappears. Great areas of vineyard with scattered trees and rows of trees.

Just past Agde is a small extinct volcanic cone. Then salt flats partly mowed, partly cult. partly

in salt marsh and succulent veg.

Large lake with salt flats inland from m. Low area around lake with halophytic veg. Area of very low dunes lining sea is cult. - vineyards and asparagus, protected by rows of reeds. Outside this, slightly higher dunes with bushes.

At Sète-Ville a rocky hill, covered by pines on landward side, by city on seaward side. The lake extends to behind this hill, which is in the edge of the city. The lake is mouth of canal which extends far beyond Agde.

Between Sète and Montpellier are a series of lagoons with a broad strip of salt marsh surrounding them and a strip of dunes between this and the sea. Back of the salt marsh is solid vineyard, salt marsh has areas of reeds, of salicornia, and of marsh grass.

East of Montpellier are vineyards on flat and rolling ground with a few scattered trees, a few rows of trees. On some small hills are patches of woods, mostly pine.

A few small woodlots of pine farther east. Rows of trees mostly *Platanus*. Some small olive grove.

On north side, away from m. are some small brush-covered hills.

Almost all cultivated ground is vineyard. Soil red.

Olive groves become more and more abundant. Hedge of *Arundo donax* occasional.

The low brushy hills extend eastward for some distance, becoming more and more covered by olive groves. Vineyards still occupying flat ground.

Some forests and scrub of *Quercus ilex* farther east. More grain and other cultivation than vineyards toward Nimes.

Hills east of Nimes covered by scrub "garrigue". Valley with meadow, grain.

fields, vineyards, etc. Some fruit trees scattered in vineyards, olive, also.

Some small woodlots of young pine, some fallow land, eastward.

Dry hills, some with low scrub "garrigue"; some of it burned over. Some with olive groves.

Olive trees mostly 2-4 m. tall, rather flat-topped. Some rather bad erosion in these hills. Some hills really wooded near Rhône. Willow-poplar forest along Rhône and on islands in it, at Tarascon.

East of the town are marshes and low cultivated ground, gardens, etc. orchards, some vineyards, reed hedges (*Arundo*). Rows of cypresses for wind-breaks. Thickets of willow and *Populus alba* in low places.

To northeast ~~the~~ limestone hills covered by gray-green scrub and scrub-forest. Some bare scarps exposed.

Some fair sized rice fields in flat land. Grain, vineyards and meadows on very slightly higher ground.

Fields separated by hedges in some ~~cases~~ cases. More grain eastward, rather extensive thickets of willow and poplar, these along river at Arles. S. of Arles fields have low levees around them, probably used at times for rice. Extensive meadows, many trees, rows of willows, planes, poplars, etc. A few vineyards here. Area very green - apparently some irrigation though ditches might be for drainage, as there are large areas of marsh. *Phragmites communis* is dominant over large part of it.

East of this are large stretches of weedy, flat uncultivated land, very rocky alluvium. Woods and scrub in distance. Soil bright rusty red.

Rather barren southern slope of Alps in distance to north.

Then cultivated ground with thick willow hedgerow, some open uncultivated land, grass,

with or without scattered trees. This ~~area~~ <sup>alluvium</sup> called "la Gran". *Spartium* common. Much open scrub. Some land cultivated by piling up rocks and removing them. Some ponds. Willows a very conspicuous feature of the landscape. Again vast open sparsely grassy plain - some attempt being made to pile up the rocks but certainly not a very encouraging task as the ground is largely made up of rocks.

Salon.

Some dissected hilly country before Marseille. flat places cult., rough, over weedy, or with scrub and patches of woods.

Around lake a considerable surface of bare rock with a sparse low scrub.

Then cultivated ground with closely spaced rows of cypress for wind breaks.

East of Marseilles are rather rugged hills mostly of limestone with many cliffs. They are covered by a rather sparse and scrubby pine forest with an understory of scrub. Lower slopes near sea terraced and cultivated, vineyards and olives.

## La Chiotat.

Pines and olives mixed near sea, pine woods inland.

Eastward hills become lower, gently sloping. Large areas scrub-covered, some pine forests, some olive groves, esp. near sea. General color a dark dull green. Then rather rugged again.

At St. Cyr is a large flat valley, mostly in vineyard and olive groves, also rows of olive trees between the vineyards.

Eastward the hills are rather rugged, partly wooded, partly scrubby vineyards and orchards, olive, etc. locally. Eastward more scrub, "garrigue", dark green with vine-covered, olive trees 1.5-2 m. tall.

touching or not. At least some pines generally, but much scrub. Lower slopes often terraced.

## Ollioules

flat land in vineyard and flower cultivation. Many olive, furrowed, hills very rocky and rather barren. Rows of *Cupressus* common. Some pine woods on low hills, similar to Toulon.

144 1954 France

July 28 - Pic du Midi (Alt.)

35911 *Linaria*  
common on rock debris.  
#  
1 12 *Linaria*  
occasional on rock debris.  
2 13 *Potentilla nivea*  
common in rock crevices.  
2 14 *Arenaria*  
common in rock crevices.  
2 15 *Arenaria*  
common in rock crevices  
and on ledges.  
1 16 *Silene acaulis*  
common in rock crevices  
and on ledges.  
1 17 *Hutchinsonia*  
common on ledges and in crevices.  
2 18 *Petrocallis*  
common on ledges, ~~and~~ in crevices,  
and in rock debris.  
1 19 *Erysimum*  
rare in rock crevices

July 30 - Antibes

20 *Gelidium*  
common in crevices just  
below low tide level.  
2 21 *Limonium*  
rocks just above high tide  
2 22 *Rubia*  
common, characteristic of *Quercus ilex* "association".

Hauts Pyrenees Alpes maritimes 145

flowers blue-violet,  
palate whitish, & the common  
form here (with #35910, 35912)  
flowers blue-violet,  
— palate orange (with #35910, 35911)  
caespitose; fls. cream  
color.  
prostrate; flowers  
white.  
forming a dense mat;  
flowers pale green.  
forming cushions; flowers  
pink.  
flowers white.  
flowers deep lavender.  
flowers bright yellow.  
deep red  
calyx lavender with white  
tips, corolla blue.  
scrambling in low bushes.  
fruit black & fleshy when ripe.

July 30 to Cap d'Antibes  
 walls with *Quercus*  
 - small patch of  
 maquis - a thick  
 scrub 2-3 m. tall, with  
*Cistus monspeliensis*  
*Myrtus communis*  
*Pistacia lentiscus*  
*Rhamnus alaternus*  
*Rubus* sp.  
*Thymus juncetum*  
*Calycotome spinosa*  
*Tannus*

On the hill around the  
 lighthouse some remnants  
 of *Quercus ilex* - *Q. pubescens*  
 forest, but with *Olea*  
 abundant. *Pinus halepensis*  
 forest below on flatter  
 portions.

The general relationships  
 here, according to Guinochet,  
 are that the *Quercus ilex*-  
*Q. pubescens* forest was the  
 original cover on calcareous  
 rocks. When this is cleared  
 it tends to be replaced by  
 maquis. This is readily  
 replaced by *Pinus halepensis*  
 which is in turn, gradually,  
 replaced by *Quercus ilex* if  
 not burned over. This  
 pattern general on calcareous

rocks east to Var R.  
 and below 300-400 m;  
 above which *Quercus pubescens*  
 is thought to have been  
 dominant in the original  
 cover. East of Var R. along  
 the coast was a strip  
 of *Ceratonia* - *Olea* forest.

On the crystalline rocks  
 the original cover was  
 thought to be *Quercus*  
*ilex* - *Q. suber* forest,  
 with *Pinus* secondary.  
 Above this, *Quercus ilex* -  
*Q. pubescens* forest.

Mediterranean species  
 observed:

*Centaurea paniculata*  
*Asperula cynanchoides*  
*Euphorbia spinosa*  
*Camphorosma* sp.  
*Tunica sascatilis*.

*Garrigue* vs. *Maquis* - ac. Guinochet  
 Distinction physiognomic -  
*Garrigue* is low, sparse,  
 ground visible between  
 bushes, mostly on calcareous  
 soils. *Maquis* 2-3 m.  
 tall, dense, chaparral-like.

July 31 - Esterel, <sup>near Gratacias</sup> about 3 km inland from Agay, on que R.  
 Quercus suber - *Pinus pinaster* woodland - trees separated, with *Garrigue* beneath them of, ~~as~~ in addition to young pines and oaks,  
*Cistus monspeliensis*  
*Cistus salviaefolius*  
*Daphne gnidium* L.  
*Pistacia lentiscus*  
*Lonicera* sp.  
*Asparagus antipolius*  
*Chillyrea angustifolia*  
*Pteridium aquilinum*

July 31 - near Gratacias,  
 about 3 km. inland from  
 Agay on que River, Esterel  
 Quercus suber - *Pinus*  
*pinaster* woodland.

35923 *Origanum vulgare*  
 1 ~~roadsides~~ roadside  
 2 24 *Quercus suber*  
 dominant tree in

July 31 - Col Belle Barbe  
 in que River, Esterel  
 Quercus suber woodland  
 with some pine, *garrigue* undergrowth  
 1 25 *Linum gallicum*  
 weedy openings  
 2 26 *Centaurea paniculata* var. *esterensis*  
 common in weedy openings

In habit *Quercus suber* looks much like *Q. wisleyensis* or *Q. chrysolepis*, or when large, *Q. aquifolia*, of SW. U.S.

The pines tend to invade after fires, but are regarded as a normal part of vegetation.

strongly aromatic herb;  
 - calyx purple, corolla pinkish,  
 tree 6 m. tall, 20 cm. diam;  
 bark harvested for cork.

flowers bright yellow.  
 erect, biennial; flowers  
 rose-pink.

July 71 - Gru R. between  
Col Belle Barbe and Mal Infernet,  
Estérel

37 in cork-oak woodland  
with garrigue undergrowth

35927 *Cistus salviaefolia*  
3 codominant species in garrigue

3 28 *Cistus monspeliensis*  
codominant species in garrigue

3 29 *Arbutus unedo*  
occasional in garrigue

1 30 *Furcraea*  
occasional

2 31 *Lavandula stoechas*  
common

1 32 *Myrtus communis*  
common

2 33 *Rhus cotinus*  
rare

2 34 *Daphne gnidium* L.  
common

1 35 *Molinia caerulea*  
very local, in small pools  
of water

This country is generally  
covered by a sparse, uneven  
stand of *Pinus pinaster* and  
considerable *Quercus suber*.  
Beneath this is a garrigue  
(maquis if tall and dense)  
of such plants as *Lavandula*

45 - 600m.

shrub 0.7 m. tall.

shrub 0.7 m. tall.

shrub 1.5 m. tall; fruit  
immature, pendent.

shrub 0.5 m. tall,  
strongly aromatic.

shrub 1-1.5 m. tall,  
aromatic when broken; flowers  
white.

shrub 1.5 m. tall.

shrub 0.8 m. tall; ~~fls~~  
principally branched  
at base; flowers whitish.

up to 1.3 m. tall.

*Phillyrea angustifolia*  
*stoechas*, *Helichrysum stoechas*,  
*Helianthemum tuberaria*,  
*Erica arborea*, *E. scoparia*,  
*Calluna vulgaris*, *Arbutus*  
*unedo*, *Juniperus oxycedrus*,  
*Myrtus communis*, *Lithelina*  
*dubia*, *Globularia* sp., *Dorichnium*

*Fumana* spp.,  
*Pentaphyllum*, *Calycotome*  
*spinosus*, *Rhamnus alaternus*,  
*Daphne gnidium*, *Rhus*  
*cotinus*, *Amelanchier* spp.,  
*Pistacia lentiscus*,  
*P. lentiscus*, and *Rubus*  
*tomentosus* (perhaps only in  
disturbed places.)

After fires the pines  
may appear at the  
same time as the scrub  
and may, locally,  
form an almost complete  
cover 1-2 m. tall. However,  
there are few really closed  
stands of mature pines.

July 31 - <sup>Hills above</sup> ~~Le~~ <sup>Le</sup> Trayas, on  
seaward side of l'Esterel,  
Alpes Maritimes

almost closed scrub  
or "garrigue" on rocky slopes.

35936 *Pinus*  
1 common throughout region  
2 37 *Calluna vulgaris*  
occasional in  
2 38 *Erica arborea*  
common in  
1 39 *Asplenium adiantum-nigrum*  
occasional in rock crevices  
1 40 *Galium rubrum*  
occasional at base of rocks

In a wet seepy spot  
are *Molinia caerulea*,  
*Osmunda regalis* and  
*Alnus glutinosa*.

There are great knobs of  
red porphyry with enormous  
talus slopes, but, acc.  
M. Guinochet, no special  
flora on the talus.

The pines here are  
generally small  
trees, not more than  
10 or 15 m. tall, 20-25 cm.  
or less thick. Here all  
are *Pinus pinaster* (*P. maritima*)

The garrigue on the seaward  
slopes is like that inland but  
has *Rosmarinus* <sup>and *Viromyrtus*</sup> added in signi-  
ficant amounts, and oaks are princi-  
pally in the canyons. Shrub 1-1.5 m. tall,  
tree 10 m. tall, 15 cm. thick.

shrub 1 m. tall, flowers  
pale purplish pink, shiny.  
shrub 1-3 m. tall.

erect, many stems from base.

154 1954 France

35941 ~~Heads~~ *Lavandula stoechas*  
very common in  
2 42 *Erica scoparia*  
occasional in  
3 43 *Quercus ilex*  
common in ravines  
2 44 *Juniperus oxycedrus*  
occasional

July 31 - 3 km. n.w. of  
Antibes  
garigue burned over  
2 years ago, bushes  
far apart.

2 45 *Prunella hyssopifolia*  
occasional  
1 46 *Linum strictum*  
rare  
1 47 *Andropogon ischaemum*  
rare  
1 48 *Dianthus*  
occasional  
1 49 *Lithospermum*  
common  
2 50 *Fumaria*  
common  
2 52 *Cistus albidus*  
common  
1 53 *Pisum*  
rare  
1 54 *Lavandula*  
rare  
1 55 *Euphorbia*

Alpes Maritimes

155

shrub 0.5 m. tall,  
aromatic  
shrub 1.5 m. tall  
tree 5 m. tall  
tree 4 m. tall, broadly  
spine-like habit,  
fruit not quite mature.

flowers crimson  
plants dry,  
flowers bright yellow.  
low shrub  
erect, flowers yellow  
erect, flowers blue  
stem red, flowers green.

156 1954 France

34956 *Teucrium*

3 local

1 57 *Thesium*

rare

1 58

common

2 59 *Inula*

common

1 60 *Asperula cynanchoides*

common

1 61

occasional

1 62 *Galium*

occasional

2 63 *Campanula*

occasional

This rather extensive  
burned area has scattered  
low shrubs, mainly  
*Pistacia lentiscus*, *Daphne*  
*genkwa*, a few small  
*Erica*, a few small oaks.  
These probably mostly  
come from root crowns  
not killed by the fire.

Many annuals and  
herbaceous perennials

1 57a *Carex*

Alpes-Maritimes

157

prostrate, aromatic

flowers whitish.

flowers white

flowers blue

involucres pearly

flowers bright yellow

flowers pinkish white

flowers purplish blue

July 31 - 2.5 km. s.w.  
Valbonne, 10 km. w.n.w. of  
Antibes

pine forest with sparse  
under-story of oaks,  
flat ground.

35964 *Centaurium*  
occasional along path

1 65 *Linum*  
occasional

2 66 *Quercus pubescens*  
common

1 67 *Rinaria*  
This forest has  
a rich ground flora  
and considerable *Pteridium*.  
The trees are 10-15 m. tall,  
~~to~~ up to 25 cm. diam.  
mixtures of *P. pinaster* & *P. halepensis*

In this region the pines  
are mostly cut for  
pulp-wood and not  
allowed to reach much  
over 10 m. tall and 10-15 cm.  
diam.

13 230 m.

flowers yellow.

shrub 2 m. tall.

3 km. e. of Valbonne is  
a dense maquis of  
*Calycotome spinosa*  
*Cistus monspeliensis*  
*Cistus alba*  
*Phillyrea angustifolia*,  
*Myrtus communis*,  
*Pistacia lentiscus*  
*Quercus ilex*  
a little *Q. pubescens*.

This scrub is 2-3 m. tall,  
and is in a sparse  
~~to~~ stand of  
*Pinus halepensis* 10-15  
m. tall, 10-20 cm. diam.

July 7 - near Biot,  
7 km. n. of Antibes,  
wasteland of a  
volcanic conglomerate  
of a basic character,  
with very sparse shrub  
vegetation, many annuals.

35968  
of as  
2 69 *Dipladine serotina*  
rare

- 1 7069 *Funaria pygmaea*  
common in <sup>small</sup> desiccated  
pools on rock surface.
- 1 71 *Crucianella*  
rare among rocks
- 1 72 *Bedum rubens*  
common among rocks
- 1 73 *Asplenium trichomanes*  
occasional in shaded  
rock crevices.
- 1 74 common in rock crevices
- 1 75 *Polypodium serratum*  
occasional in rock crevices
- 1 76 *Gymnothamnium*  
occasional in rock crevices
- 2 77 *Ceterach officinarum*  
common in rock crevices
- 1 78 *Paronychia*  
rare in ~~water~~ small  
desiccating pools
- 2 79 *Elaginella*  
common on shaded rock  
faces and ledges
- 30 *Plantago* desiccating rock pools

sheet  
grass [80] + 7 b an  
10,000

IGN

263  
2 8 spes 40-70 an.

263  
6 Tragopan 50-100 an.

263  
Cannes XXXVI-44  
50, 87 an.

dried completely at this  
season.

dried completely at this  
season.

curled up in dry weather.

completely dry at this  
season.

prostrate, closely adherent  
to rock, mostly completely  
dry at this season.

completely dry at this season.

sheet  
frame [8a] + 7 b an  
10.000 -

IGN

---

by Asper 40-70

---

6 trays Van 50-100

canvases XXVII - 44

50,00

July 7 - near Biot,  
7 km. n. of Antibes.  
wasteland of a  
volcanic conglomerate  
of a basic character,  
with very sparse shrub  
vegetation, many annuals.

35968

of ss

1 2 69 *Diplachne serotina*  
rare1 70 69 *Juniperus pygmaea*  
common in <sup>small</sup> desiccated  
pools on rock surface.1 71 *Crucianella*

rare among rocks

1 72 *Pedum rubens*

common among rocks

1 73 *Asplenium trichomanes*  
occasional in shaded  
rock crevices.

1 74

common in rock crevices

1 75 *Polypodium serratum*  
occasional in rock crevices1 76 *Gymnogramme*

occasional in rock crevices

2 77 *Ceterach officinarum*

common in rock crevices

1 78 *Paronychia*rare in ~~rock crevices~~

small desiccating pools

2 79 *Relaginella*

common on shaded rock

faces and ledges

30 *Plantago* desiccating rock pools

400-10 m.s.n.m.

stiff

dried completely at this season

curled up in dry weather

completely dry at this season

prostrate, closely adherent  
to rock, mostly completely  
dry at this season

completely dry at this season

July 31 - Biot - exposure of basic volcanic conglomerate with labradorite. Soil pH tested by Guinoclet is 9.0. Mass of boulders up to several dm. diameter in a consolidated but rather crumbly matrix.

This formation covers about 30 sq. km. (or 30 km. sq.?) and has very little soil. Its vegetation presents the aspect of a desert.

The vegetation is sparse, only  $\frac{1}{4}$  to  $\frac{1}{2}$  of the ground is actually covered by the woody vegetation. This is a very sparse scrub with *Cistus monspeliensis* the most abundant species, up to 1 m. tall, with some *Ravendula stoechas*, and with scattered *Pinus halepensis*.

The vegetative period is from December to April, during which time water actually runs over the ground and stands in shallow pools. Ephemeral annuals are present in large numbers.

and with mosses cover much of the bare ground and the beds of the desiccating pools. An Isoetes is found in the desiccating pools.

These observations were made on a moderate west slope, over which an old Roman road went whose wheel-tracks are still apparent, in places 10-20 dm. deep. In these wheel-tracks are tiny annuals and dormant perennials, incl. the Isoetes, *Plantago pusilla*, and *Juncus pygmaea*.

The ravines on the east slopes, and especially the ravines, have more trees in them. On the rocky walls of the ravines are several xerophytic ferns, an annual including Ceterach, an annual sedum of which only the hard dry inflorescence remains, *Umbilicus pannulatus*, of which only the dry fruiting spikes remain, *Selaginella*, etc.

164

165

Aug. 1 - hills e. of Nice  
are pine-covered.

Beyond Nice is Cap  
Ferrat, generally pine  
covered but mostly  
occupied by houses, etc.

East of Beaulieu in mts.  
are high bluffs and  
cliffs of light gray  
rocks, prob. limestone,  
the tops of the bluffs  
with scattered pine,  
the cliffs with almost  
no vegetation. At the  
base little wild vegetation,  
but semi-wild, are  
numerous *Agave americana*,  
many of them flowering,  
also a very large *Apartis*,  
prob. *A. megacantha*, and  
cultivated plants of a  
generally subtropical  
character (*Bougainvillea*,  
*Nerium*, *Phoenix canariensis*,  
etc.) which contrast strongly  
with the pines which  
are most abundant  
and, with *Olea*, form the  
tree background.

Same through Monaco  
and Monte Carlo. Many  
*Ficus carica*, *cypressus*,  
*tempervirens*, etc. Some  
*Eucalyptus*, *Acacia* spp.,

*Quercus ilex*, *Arundo*, etc.  
Pines seem to be mostly  
*P. halepensis*.

East of here, at Cap Martin  
some semi-wild thickets  
with oaks, etc., some  
pines *halepensis* *mollis*.  
Menton - mts. behind  
it are wooded below,  
very sparsely vegetated  
above.

Lowlands rather  
green and luxuriant  
with *Ficus*, *Olea*, *Phoenix*  
*canariensis*, *Echinops*,  
*Arundo*, *Araucaria excelsa*,  
*Cupressus*, and gardens  
of all sorts. *Citrus*, *Eriobotrys*,  
*Platamni*, *Bougainvillea*,  
*Washingtonia*, *Cratonia*,  
*Acacia* spp., *Magnolia*  
*grandiflora*, *Eucalyptus*,  
various other palms, etc.

Dry aspect continues to  
Genoa, with in places  
more or less trees on the  
high slope.

From Genoa east along  
the coast the cultivated  
and semi-wild vegetation  
is much more luxuriant,  
with many pines, esp.  
*P. pinea*, cypresses, *Eucalyptus*  
and many other trees.

of Aug. 1 - Dry looking hills, almost completely terraced, partly with olive groves, vineyards, etc. bet. frontier and Ventimiglia. Cliffs and high bluffs above V. olive groves in parts not too steep. Stony river-flats with pioneer vegetation.

Eastward, coastal slopes are terraced and have rows of grape vines and some fig trees, but prevailing tone of landscape is determined by olive trees. Some pines, but even these have a gray tone.

Lowest few yards above water, where not cultivated, have agave, and much *Arundo donax*, as well as *Atriplex halimus* and many other halophytes. Where there are shrubs they are low, compact, and rounded, due probably to spray shearing. Some attempt to plant pines here behind shelter. The most common cultivation is carnation-culture, at least n. of S. Lorenzo Cipressa.

Railroad is only a few feet above sea-level.

East of Imperia-Meglia the terracing of the hills become less marked. Olive still dominate the lower slopes.

Near Andora the hills are ~~more~~ rocky and are covered by a rather sparse scrub down to a rather low level.

Here the rr. leaves the sea for a very short distance.

Eastward at least the lower slopes of the hills are ~~less~~ terraced and cultivated. Locally there are wide flat valley mouths, intensively inhabited and cultivated.

Seldom is there a square meter of ground flat enough to cultivate that is not cultivated.

The coastal strip, seaward of the rr., if more than a few yards wide, is mostly occupied by houses and gardens, many fruit trees, oranges, peaches, figs, etc. For considerable distances, where the land is very

low and would be covered by storm waves, there is a substantial concrete wall 1.5 m. high at the top of the beach and the several yards of flat ground behind it is in gardens.

Olive groves on most lower slopes except where too rocky.

Same pattern generally eastward. ~~Genoa~~ <sup>forward</sup> Savona becomes fewer. ~~Genoa~~ <sup>forward</sup> The higher and rockier parts of the coastal mountains are entirely bushy. Lower, among the olive groves, are occasional small groups of umbrella shaped *Pinus* pines. On bluffs above sea are patches of *Erica* scrub-bushes not touching.

Around Savona the higher hills are woods with pine.

Dry aspect continues to Genoa, with, in places, more or less trees on the high slopes.

From Genoa east along the coast the cultivated and semi-wild vegetation is much more luxuriant

with, among the dominant olives, many pines, esp. *P. pinaster*, cypress, palms, and many other trees, even *Robinia*. The low strip along the coast is almost entirely villas, etc. to Uscita. Olive groves ~~do not~~ reach half-way or more to the tops of the hills surrounding Uscita. Above them are pine woods.

East of this around ~~Appollo~~ <sup>Appollo</sup> the same pattern continues, with, in places, olives to the tops of the hills, locally pines down fairly low.

Same pattern continues ~~southward~~ <sup>southward along southeastern</sup> along the coast, with pine in steep places coming even down to the sea-cliffs. Levanto. Much terracing, with terrace surfaces at about a 30-45° slope.

Left sea at La Spezia. Hills inland wooded. lower slopes with olive groves. Mountains in distance very rugged, upper parts bare and rocky.

Vegetation in thickly settled valley luxuriant - olives, fruit trees, aroids, grapes, poplars.

Woods in patches on lower slopes of hill are deciduous. Pines no longer important in valley around Faryana. Upper slopes densely wooded.

Broad flat valley, mostly intensively cultivated with a close mixture of gardens, rows of grapes and fruit trees. Occasional fields. Many of grapes on high wire. Olives abundant. Densely populated. Some of lower slopes of hill grazed, but mostly covered by olives.

Mountain slopes above Carrara-Avenza sparsely brushy but badly scarred by marble quarries and their debris cones.

RR several km. from sea on flat plain. Higher mountain tops bare.

Beyond Massa hills are covered by pine forests except for cleared and terraced parts.

Then in Garfagnana *Populus alba* and *Salix* begin to dominate landscape. Grape vines on trellises. Then the poplar changes to a quercous one. Lower slopes with olive groves.

Trees - fruit, willow, poplar, olive completely dominate landscape on all of this coastal plain. somewhat more open toward Viareggio, but only locally.

South of her vineyards become more important on flat land. Then a large forest of *Pinus pinea*, presenting a very odd appearance with flat crowns, scattered under story of oaks, and ground layer of heather and *Pteridium*, density of this layer varying considerably.

Then some open fields and meadows with a few long rows of trees.

Then the fields become more sub-olivaceous and lined with rows of willows and a single row of grapes around each field.

Then more open country but with cultivation in rather small plots separated by ditches but now hedges and trees only along roads.

Pisa. Amo V. generally mixed cultivation, small plots, separated by rows of grape vines. Hills to north densely wooded.

Same pattern eastward.  
Rolling hills along south  
side of valley are cultivated  
but steeper slopes are  
either in small woods or  
terraced.

Aug. 5 - Florence to Milan

Flat valley with  
mostly olive groves and  
vineyards, some more  
cult. Grapes trellised  
up on high wires or  
even climbing in trees.

On east a high range  
of hills or mts. olive groves  
running up on lower gentle  
slopes, green scrub or scrub  
forest with <sup>other</sup> ~~even~~ stand  
of pine on slopes above, with  
some patches of sparse  
scrub. High ~~sus~~ <sup>summits</sup>  
summits with sparse  
scrub & grassy. Very rocky.  
Prato. Some citrus and  
fig with olives, grain  
between. R.R. lined with  
Robinia thickets, some Ailanthus.  
Beyond Prato m. enters  
smaller side valley  
between similar rocky  
hills with scattered pine  
or cypresses.

Vaiano. Above this,  
flat narrow valley  
bottom has olive & grapes,  
a few other fruit trees, some  
poplars & willows and  
grunds along stream.  
Pine forests and some  
broad-leaf forest - oak and  
chestnut on slopes. In  
place terraces and olive  
groves run far up hill.  
Robinia thickets along  
roads and railroad.

After a series of  
long tunnels, emerges into  
a valley with rather  
gently sloping sides,  
the greater part of  
which, on s. side, are  
cultivated. Some woods  
on steeper or higher parts  
seems to be mainly  
meadows, some vineyards.

Then enter a part of  
valley with steep  
sandstone sides,  
these wooded except for  
small patches of  
cultivation. Woods scrubby.  
Montezuno - Vado.

More tunnels. Then a  
broader valley with  
gentle open cultivated  
slopes on both sides.

Mostly grain fields and meadow. Flat valley bottom with fruit trees, of grapes, alfalfa. Rows of poplar. Some vineyards on lower slopes. Miss. cult. between rows of grapes and trees on valley floor. Apparently no olive trees. Approaching Bologna. Bologna is in flat country surrounded by very low hills. Fruit trees abundant.

North of Bologna is a broad flat plain, all under intensive cultivation. Small fields of alfalfa, maize, separated by rows of trees - elm + poplar, mostly, with grapes climbing in them. Willows along ditches and in wet places. A few cittaone hedgerows. Nut trees locally. Locally, also, the rows of trees are absent between fields, and appearance is of larger open fields, but cult. is still in small patches.

Same vineyards, some tomatoes, beets, millet? <sup>soybean</sup> Other vegetables in addition to dominant alfalfa and maize. Small orchards. When grapes are not with trees, they are up on ~~wires~~ wires 1.8 - 2 m. tall. Much bare plowed ground. Landscape is tree-dominated but actually mostly open ground. Modena.

This pattern ~~is~~ does not vary much for a long distance except for one or two broad flat stony river-beds with little or no water. Irregular strips of bushy willows along banks.

Much of this land is irrigated by pumping water from wells.

Locally tomatoes and maize are grown together. Seems to have an inhibiting effect on the maize, as the plants are relatively small.

Parma. Riverbed dry, weedy. Shelters of Robinia along m. generally, but not everywhere.

near Fidenza the general aspect becomes somewhat more open, with larger fields, not so often separated by rows of trees and grapes, but some hedgerows, more rows of cherry or peach trees. Some fair sized tracts with no trees. Trees do not completely dominate landscape. Misc. cult. tomatoes, maize, tobacco, alfalfa, etc. irrigated from wells. Almost no ~~grapes~~.

Riverbeds dry.

Cadeo. More poplars. Few grapes.

Piacenza. Large river with broad bed and considerable water. Willows along banks but not many.

Large fields and groups of fields separated by rows of poplars. Some fruit trees. Misc. cult. alfalfa, maize, few grapes. Some small patches of poplars. Some willows.

Mulberries for silkworms. Poplars dominate landscape.

Secognago. Lodi.

Irrigation from canals, all way to Milan. Country gets more open approaching Milan.

Milan northward - flat land - misc. cult. maize and alfalfa principally. Dense population. Some fruit trees. Some poplars. Robinia abundant along rr. and roadsides.

Cannago L.

Flat valley with meadow, low wooded escarpments on sides, cut in flat country. Woods on well. entirely of Robinia thicket.

This ravine winds into somewhat rougher country. Robinia thickets up to 10 m. tall. Approaches foot of Alps. - must be cut in a great alluvial fan.

Albate-Camerlata - almost at foot of mts.

Mts. wooded but with much terracing even on very steep high slopes. Robinia very abundant around Como, Ailanthus also.

Lake Como surrounded by steep mountains with woods, but with scattered houses clear to tops. A peninsula from Como up to a thickly built up hill-top.

Chasso - surrounded by wood houses, with a few scattered houses and clearings. Flat valley bottom with misc. cult. scattered groups of poplars and willows. Woods on hills deciduous. Those on low hills largely Robinia thicket, more mixed upwind.

Talus at base of high cliffs, slightly wooded cliffs with much bare white rock. Upper part of valley mostly in meadow, some cult. Irrigated.

Lake Lugano surrounded by steep densely wooded slopes. Narrow flat land on n. e. side, with meadow and houses. Very little on other sides.

Maroggia - Melano. Dense deciduous woods on all steep slopes. seem to be largely chestnut. Lugano.

Vineyards on lower slope on east side of valley, above lake, valley of R. Ticino. Upper and steep lower slopes

Densely wooded - mostly broad leaf trees, some conifers on and around summit. Valley winds between steep slopes, quite narrow, a few meadows in bottom, small vineyards ~~at first~~ on slopes. ~~surrounded~~ ~~now~~ thickets, ~~is~~ along n. mostly Robinia.

On the high slopes, where there is a bit of moderate slope there is a clearing usually with a house. Vineyards still on lowest slopes near Rivera Robinia.

Tunnel to Lago Maggiore broad plain above the lake all in green farms, mostly meadow, a few trees, scattered houses.

Steep slope round this valley mostly wooded Castanea and Robinia, but any possibly cultivable slope cleared. Lowest ones in grapes.

This plain winds for some distance to Cubiasco.

Grapes up on high wires, 1.2 m. or even more. same to Bellinzona. Here valley narrows. slopes are

rocky and wooded, still with chestnuts and other broadleaf trees. Grapes and meadows in valley bottom. High summits very steep and bare. General slope here  $45^{\circ}$  or more, some of them steeper at bottom.

Above this, below Isogna-pines appear both on valley floor and on summits.

Valley walls get steeper and much rockier, enormous bluffs and cliffs, woods scrubby and sparse, thick <sup>scrub</sup> on talus.

Biasea. Great cliffs on east side. Still grapes, on trellise, in valley bottom, otherwise meadows. Snow patches visible on high peaks. Above this valley becomes a tremendous gorge a few hundred m. wide, with towering peaks and cliffs with hanging valleys on both sides. Sloping places scrub-covered with scattered trees. Cliffs bare or nearly so. High slopes covered by coniferous forest, prob. spruce. Around Giorne the valley

bottom, a bit wider, is covered by vineyards, entirely on trellises.

Slopes above here with beech, ~~and~~ birch, and spruce(?) woods.

Lavago. Conifers and birches except on talus at bottom which has a broadleaf scrub. Valley bottom with willow-birch thickets and meadows. Magnificent *Picea* on bluffs, also *Saxix*.

Soon they clothe everything except cliffs and valley floor. Some ~~but~~ admixture of birch.

Then no significant meadow area in valley floor. Gorge very narrow.

Rodi-Fiesso. - valley slightly wider, meadow runs up slope a little. One side has spruce forest showing conspicuous avalanche scars. Other side some spruce, large areas of pure birch, some high meadows.

Ambriflotta

Some *Sorbus* in lower forests.

Valley widens out and meadows become more extensive both in valley bottom and on slopes. High peaks around are bare rock with patches of snow. Airolo. Wide valley surrounded by very sharp high peaks.

At Gotthard tunnel 12 minutes  $\pm$ , to Göschenen. Here, high practically bare rock cliffs. Some patches of spruce forest. Snow patches everywhere. Glacier at head of valley. Lower talus cleared, higher with spruce forest. (Highest slopes in meadow and low scrub. Peaks above this bare rock.)

Avalanche scars are sharp clear stripes running down through spruce, grassy or with very low scrub. Steep mountain torrents in vertical ravines with debris cones at bottom.  $\frac{1}{2}$  this grass covered.

Aug. 7 - Fribourg - Geneva  
Predominantly hay meadows with some grain fields. Many patches of forest, this either beech, spruce, or mixed beech, fir and spruce in varying proportions. Fruit trees around houses. alnus and salix along streams. Some Robinia along  $\pi$ . but not much. A few birches along fences and in the occasional hedgerows.

Some vegetable gardens. Agriculture generally in small plots. alfalfa common, some Onobrychis.

Gently hilly country. Perhaps 5% in woods. Everything except the grain is very green. Grain is being harvested.

Romont.

Some oaks in hedgerows, and in edges of forest patches.

Vauderens - edge of a lower level of rolling country with the Jura in the distance. This level must be at least 10-15% wooded, a even more. spruce predominates. Otherwise same general pattern.

The beeches here seen in the upper parts of their crowns, normal in lower parts. This observed more or less throughout trip.

Palaisieus. Near here some *Abies* and some *Pine* observed in forest - mostly on steep slopes and ravine sides. Also some *larch* *ancuparia*.

Quite a few walnut trees scattered around in fields, and esp. in hedge-rows, near Puidoux and Lake Geneva.

Lower slopes above Lake Geneva are in vineyards - the vines mostly staked but not on wires. Some orchards. Thickets in ravines.

Lausanne.

Hilly <sup>a rolling</sup> country, partly vineyard, partly misc cult. partly woods, extends some distance back from lake. Sonay. Thickly populated. Gardens of all sorts. Fruit trees. Ornamental Orchards.

Toward Geneva this rolling country narrows and becomes much flatter. The hills back of it are mostly wooded except the lower slopes. The flats are mostly cult. with beehives, no hedgerows, few orchards, many vineyard and grain fields. Few patches of woods.

Widens again. Jura in distance. Densely wooded.

Nyon.

Woods here have few conifers. Mostly beech. Some oak. A few spruce & pines.

Houses become more numerous again.

Versoix.

Thickets and rows of trees, as well as orchards numerous. Trees dominate landscape. *Robinia* abundant.

196

1959 Switzerland

Aug.

July 6 - Engstlensee, Canton Bern 1850 m.  
meadows with scattered trees

Bern Canton

Unterwalden Canton

197

3597

*Pinus cembra*

1 83

scattered trees, with *Larix*  
said to be remnants of former forest.

tree 10 m. tall.

1 87

*Pinus cembra*

same

tree 14 m. tall. staminate  
cones bright red.

Aug. between

July 6 - Engstlensee and  
Jochpass, Canton Bern

2000 m.

meadow patches on rocky banks

flowers crimson

1 83

*Primula*

rare

flowers greenish; leaves  
in one plane.

1 84

*Tofieldia*

occasional

flowers rose-purple

1 85

*Soldanella*

locally common

July 6 - Engstlensee, Canton Bern

86 *Tofieldia*

common in

Aug. 1 Tannenalp, Canton Unterwalden 1900 m.

leaves in one plane, buds only.

1 86

*Tofieldia*

Aug. end of

July 6 Melchsee, Unterwalden

1900 m.

said to be good cattle food.

1 87

*Plantago alpina*

common

creeping, spikes erect.

1 88

*Lycopodium selago*

unpalatable to cattle

1 89

*Lycopodium selaginell*

1 90

*Mardus strictus*

common locally

tufted

1 91

*Trichophorum?*

common

Aug.

July 1 - Engstlensee, Canton Bern  
 75992 *Asplenium viride*  
 occasional in rock crevices

Aug.

July 6 - Valleys of  
 Melchaa and Melchthal  
 above Larnen - meadow  
 with patches of woods,  
 the steeper slopes almost  
 completely wooded, with  
 beech-fir woods - mostly  
*Fagus* with some *Abies*  
 and *Picea*. This is the  
 basic vegetation type at lower  
 altitudes in this part of the  
 country. Above this, from  
 perhaps 1000 to 1800 m. or  
 a little higher, is *Picea*  
 forest, and above it was  
 formerly *Pinus cembra*-*larix*  
 forest, now mostly replaced  
 by meadow or pasture. Above  
 this, perhaps above 2000 m.,  
 alpine meadow.

In the higher parts of the  
*Fagus*-*Abies* belt *Acer pseudo-*  
*platanus* and *Picea abies*  
 are common, as well as *Fraxinus*.

The meadows that now  
 occupy the place of the  
 former *Pinus cembra*-*larix*  
 belt have a mixture of the  
 plants that grew under these  
 trees with those of the

rachis of pond green.

meadows above. The  
 former existence of the  
*Pinus* and *larix* is determined  
 by the persistence of  
 herbaceous species char-  
 acteristic of their ground  
 layer, and of scattered  
 remnants of the forest.  
 These meadows have  
 been heavily grazed for a  
 long time and have  
 assumed a low compact  
 turf character, the  
 vegetation not usually more  
 than 10 cm. tall.

This is the common type  
 around the Melchsee  
 at about 1900 m. on calcareous  
 rock. This limestone  
 shows conspicuous lapiés  
 or erosion channels, which  
 shelter many interesting  
 plants. This area is completely  
 bare of trees and all shrubs  
 except prostrate ones such  
 as *Salix retusa*, *Juniperus*  
*communis* and *Rhododendron*  
*biserratum*. There are many  
 herbs characteristic of  
 the "tall meadow" and ~~after~~

some from above timberline.  
The annual precipitation  
here is about 2000 mm.

This type of meadow  
continues through the  
Tannenalp and around  
Tannensee. Around  
both Melchisee and  
Tannsee are zoned  
marshes and boggy  
ground. In low spots  
in the valley are boggy  
or marshy spots with  
some species different  
from those of the ~~dry~~ drier  
meadows. Locally, also, are  
areas of *Nardus stricta*  
which is stiff and harsh  
and which is so disliked  
by the cattle that when  
they accidentally bite off  
a tuft of it they spit it out.  
Dry tufts of *Nardus* are  
common in places. It seems  
that both *Nardus* and a  
big yellow *Ranunculus* have  
been greatly favored by  
grazing.

Over the line in Bern Canton  
there is a steep slope which  
has been protected from grazing.  
It has "tall meadow" vegetation  
up to 3-4 dm. tall, or more,  
with many showy flowers,

Unterwalden and Bern cantons.

such as *Rhinanthus*, *Dianthus*,  
*Anemone*, *Lotus*, *Delphinium*, etc.  
Very rich in *bi-bracteate* species.  
Here are patches of *Picea* and  
occasional trees of *Pinus cembra*.

Around Engstlensee is a  
grazed meadow with commonly  
scattered *Picea*, individuals  
and patches, with some *Pinus*  
*cembra* and *Larix*. The  
general background here  
is grass with many herbs,  
and with shrubs such  
as *Rhododendron*, *Daphne mezereum*,  
*Vaccinium myrtillus*, *V. uliginosum*,  
and *Calluna*. This extends  
up to forestgrass, but the  
trees drop out not far above  
the lake.

On the north slope of Jochpan  
are rocky hills covered by  
meadows with *Ranunculus*,  
*Myosotis*, *Chrysanthemum*,  
*Cirsium heterophyllum*, *Gentiana*  
*verna*, *Dryas octopetala*,  
*Athyrium*, etc. with  
patches of *Vaccinium* heath.  
Snow patches.

On the slope across the  
valley of Engelberg timber line  
is clearly visible at perhaps 2000 m.  
well below the scree slopes and  
cliffs. Below it is steep meadow  
with patches of spruce.

These mountains are all limestone.



